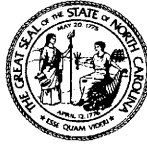


**Attachment 1**

**Final Categorical Exclusion and Final Section 4(F) Evaluation,  
United States Department of Transportation, Federal Highway  
Administration, and North Carolina Department of Transportation,  
Division of Highways, Bridge No. 143 on SR 1304 (Tipton Hill/Ray Road)  
Replacement Over North Toe River Mile 0.5, Yaney/Mitchell  
Counties, NC – Federal Aid Project No. BRZ-1304(4),  
State Project No. 8.2880401, T.I.P. No. B-2848, June 2003**



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

October 6, 2006

U. S. Army Corps of Engineers  
Asheville Regulatory Field Office  
151 Patton Avenue / Room 208  
Asheville, North Carolina 28801-5006

ATTN: Mr. Steve Lund  
Cc: Mr. David Baker  
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 & 33 Permit Re-Application** for the proposed replacement of Bridge No. 143 on SR 1304 (Tipton Hill Road/Ray Road) over the North Toe River, Yancey/Mitchell Counties. Federal Aid Project No. BRZ-1304(4), State Project No. 8.28880401, TIP Project No. B-2848.

Reference: B-2848 Nationwide 23 and 33 Permit Application dated June 1, 2004.

Please find enclosed a copy of the Categorical Exclusion (CE), Pre-Construction Notification form (PCN), permit drawings, roadway plans, stormwater management plan, and the U.S. Fish and Wildlife Service Biological Opinion for the above referenced project. A Nationwide 23 and 33 Permit Application was previously submitted on June 1, 2004. Due to the delays in obtaining the Biological Opinion the first application was verbally put on hold by the USACE. This permit application replaces the June 1, 2004 application. The North Carolina Department of Transportation (NCDOT) proposes to replace existing Bridge No. 143 on SR 1304 over the North Toe River [DWQ Index # 7-2-(27.7), Class "C; TR"] on the Yancey and Mitchell County line. The project involves replacing Bridge No. 143 on a new alignment to the northwest of the existing structure. During construction, traffic will be maintained on the existing bridge.

**IMPACTS TO WATERS OF THE UNITED STATES**

General Description: The water resource within the project area for B-2848 is the North Toe River. The North Carolina Department of Environment and Natural Resources classifies the North Toe River as "C Tr". The DWQ Index number is 7-2-(27.7) for this portion of the river that is located in the Hydrological Cataloging Unit 06010108.

Permanent Impacts: The North Toe River will be impacted by the proposed project. Construction of the proposed project will result in less than 0.01 acre (100 square feet) of permanent impacts to jurisdictional surface waters, from the construction of bridge piers.

**MAILING ADDRESS:**  
NC DEPARTMENT OF TRANSPORTATION  
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS  
1598 MAIL SERVICE CENTER  
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1334  
FAX: 919-715-5501  
WEBSITE: [WWW.NCDOT.ORG](http://WWW.NCDOT.ORG)

**LOCATION:**  
2728 CAPITAL BLVD.  
PARKER LINCOLN BUILDING, SUITE 240  
RALEIGH NC 27604

Temporary Impacts: The North Toe River will be temporarily impacted by the proposed project. Construction of the proposed project will result in a total of 0.35 acre of temporary impacts to jurisdictional streams, in the form of temporary rock causeways and temporary support structures (see permit drawings). Temporary rock causeways will be used to provide access for equipment during construction of the new structure and removal of the old bridge once the new bridge is in place. It is assumed that the contractor will begin construction of the proposed temporary rock causeways shortly after the date of availability for the project. The Let date at the time of this application is January 16, 2007 with a review date of November 28, 2006.

Restoration Plan: Upon completion of the new bridge, the temporary fill will be removed from the North Toe River, to natural grade and the area will be planted with native grasses and or tree species as appropriate.

Utility Impacts: There will be no impacts from utilities with this project.

## **BRIDGE DEMOLITION**

The existing Bridge No. 143 is a one-lane structure with five spans totaling 367-feet. The superstructure consists of a reinforced concrete deck, asphalt wearing surface, and metal guardrails. The substructure consists of reinforced concrete earth-filled spandrel arches, reinforced concrete abutments, and reinforced concrete piers. The depth from roadway crown to the streambed is approximately 28-feet.

The NCDOT will adhere to appropriate guidelines for bridge demolition and removal including those presented in "Pre-Construction Guidelines for Bridge Demolition and Removal", "Policy: Bridge Demolition and Removal in Waters of the United States", "Best Management Practices for Bridge Demolition and Removal", "Best Management Practices for the Protection of Surface Waters", and "Design Standards in Sensitive Watersheds".

## **FEDERALLY-PROTECTED SPECIES**

As of April 27, 2006 the U.S. Fish and Wildlife Service (USFWS) lists nine federally protected species (Table 1) for Yancey County, and ten for Mitchell County (Table 2). Federal Status and Biological conclusions are listed in the following tables. A Biological Opinion (BO) for Appalachian elktoe has been rendered by the USFWS (see attached).

**Table 1. Federally protected species of Yancey County.**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Federal Status</b>	<b>Habitat</b>	<b>Biological Conclusion</b>
<i>Clemmys muhlenbergii</i>	Bog turtle	T S/A	N/A	No Survey Required
<i>Corynorhinus townsendii virginianus</i>	Virginia big-eared bat	E	No	No Effect
<i>Puma concolor cougar</i>	Eastern cougar	E	No	No Effect
<i>Glaucomys sabrinus coloratus</i>	Carolina northern flying squirrel	E	No	No Effect
<i>Alasmodonta raveneliana</i>	Appalachian elktoe	E	Yes	May Affect, Likely to Adversely Affect
<i>Microhexura montivaga</i>	Spruce-fir moss spider	E	No	No Effect
<i>Geum radiatum</i>	Spreading avens	E	No	No Effect
<i>Hedyotis purpurea var. montana</i>	Roan mountain bluet	E	No	No Effect
<i>Spiraea virginiana</i>	Virginia spiraea	T	Yes	No Effect

**Table 2. Federally protected species of Mitchell County.**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Federal Status</b>	<b>Habitat</b>	<b>Biological Conclusion</b>
<i>Clemmys muhlenbergii</i>	Bog turtle	T S/A	N/A	No Survey Required
<i>Glaucomys sabrinus coloratus</i>	Carolina northern flying squirrel	E	No	No Effect
<i>Myotis sodalis</i>	Indiana bat	E	No	No Effect
<i>Alasmidonta raveneliana</i>	Appalachian elktoe	E	Yes	May Affect, Likely to Adversely Affect
<i>Microhexura montivaga</i>	Spruce-fir moss spider	E	No	No Effect
<i>Geum radiatum</i>	Spreading avens	E	No	No Effect
<i>Liatris helleri</i>	Heller's blazing star	T	No	No Effect
<i>Solidago spithamea</i>	Blue Ridge goldenrod	T	No	No Effect
<i>Spiraea virginiana</i>	Virginia spiraea	T	Yes	No Effect
<i>Hedyotis purpurea</i> var. <i>montana</i>	Roan mountain bluet	E	No	No Effect

## **AVOIDANCE AND MINIMIZATION**

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Of the three reasonable and feasible alternatives considered, the chosen best minimizes impacts to the sensitive natural ecosystems in the vicinity of the project site, and provides the most economic design. In addition, "Design Standards in Sensitive Watersheds", NCDOT's guidelines for "Best Management Practices for the Protection of Surface Waters", and "Guidelines for Construction Adjacent to Trout Waters" will be enforced throughout the duration of the project construction.

Since this project will be affecting the federally-protected Appalachian elktoe, areas adjacent to the project site will be regarded as "Environmentally Sensitive Areas" on the Erosion Control Plans. Please refer to the project commitments for additional detail.

## **REGULATORY APPROVALS**

Section 404 Permit: It is anticipated that the temporary work bridge across the North Toe River will be authorized under Section 404 Nationwide Permit 33 (Temporary Construction Access and Dewatering). We are, therefore, requesting the issuance of a Nationwide Permit 33 authorizing temporary rock causeways in the North Toe River. All other aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR § 771.115(b). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

Section 10 Permit: We are requesting the issuance of a Section 10 Permit for the construction of this project in navigable waters of the United States (33 U.S.C. 403).

Section 401 Certification: We anticipate 401 General Certifications numbers 3403 and 3366 will apply to this project. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.



A copy of this permit application will be posted on the DOT website at: <http://www.doh.dot.state.nc.us/preconstruct/pe/neu/permit.html>. If you have any questions or need additional information, please contact Chris Manley at [cdmanley@dot.state.nc.us](mailto:cdmanley@dot.state.nc.us) or (919) 715-1487.

Sincerely,

Gregory J. Thorpe, Ph.D.  
Environmental Management Director, PDEA

W/attachment

Mr. John Hennessy, NCDWQ  
Ms. Marella Buncick, USFWS  
Ms. Marla Chambers, NCWRC  
Mr. Harold Draper, TVA  
Dr. David Chang, P.E., Hydraulics  
Mr. Greg Perfetti, P.E., Structure Design  
Mr. Mark Staley, Roadside Environmental  
Mr. J.J. Swain, P.E., Division 13 Engineer  
Mr. Roger Bryan, Division 13 Environmental Officer

W/o attachment

Mr. Jay Bennett, P.E., Roadway Design  
Mr. Majed Alghandour, P. E., Programming and TIP  
Mr. Art McMillan, P.E., Highway Design  
Mr. Scott McLendon, USACE, Wilmington  
Ms. Stephanie L. Caudill, PDEA

**Office Use Only:**

Form Version March 05

USACE Action ID No. \_\_\_\_\_ DWQ No. \_\_\_\_\_

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

**I. Processing**

1. Check all of the approval(s) requested for this project:

<input checked="" type="checkbox"/> Section 404 Permit	<input type="checkbox"/> Riparian or Watershed Buffer Rules
<input type="checkbox"/> Section 10 Permit	<input type="checkbox"/> Isolated Wetland Permit from DWQ
<input type="checkbox"/> 401 Water Quality Certification	<input type="checkbox"/> Express 401 Water Quality Certification
2. Nationwide, Regional or General Permit Number(s) Requested: NW 23 & 33
3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☒
4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐
5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

**II. Applicant Information**

1. Owner/Applicant Information  
Name: Gregory J. Thorpe, Ph.D., Environmental Management Director  
Mailing Address: 1598 Mail Service Center  
\_\_\_\_\_  
\_\_\_\_\_  
Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794  
E-mail Address: \_\_\_\_\_
2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)  
Name: \_\_\_\_\_  
Company Affiliation: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
Telephone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_  
E-mail Address: \_\_\_\_\_

### III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Bridge No. 143 replacement
2. T.I.P. Project Number or State Project Number (NCDOT Only): B-2848
3. Property Identification Number (Tax PIN): N/A
4. Location  
County: Mitchell and Yancey Nearest Town: Ramseytown  
Subdivision name (include phase/lot number): N/A  
Directions to site (include road numbers/names, landmarks, etc.): Bridge No. 143 over the North Toe River on SR1304
5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)  
Decimal Degrees (6 digits minimum): 36°01'30" °N 82°19'00" °W
6. Property size (acres): N/A
7. Name of nearest receiving body of water: North Toe River
8. River Basin: French Broad  
(Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at <http://h2o.enr.state.nc.us/admin/maps/>.)
9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Hunt Dale Community: R/R, Gas station, Saw Mill, Church  
Natural Forest

10. Describe the overall project in detail, including the type of equipment to be used: \_\_\_\_\_  
The project involves replacing Bridge No. 143 on a new alignment to the northwest of the existing structure. During construction, traffic will be maintained on the existing bridge. Construction and Earth moving equipment will be used.
- \_\_\_\_\_
- \_\_\_\_\_

11. Explain the purpose of the proposed work: To replace Bridge No. 143.
- \_\_\_\_\_
- \_\_\_\_\_

#### **IV. Prior Project History**

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. June 1, 2004 NW 23 and 33 application was submitted. BO delays put permit process on hold. Current application replaces June 1, 2004 application.

\_\_\_\_\_

\_\_\_\_\_

#### **V. Future Project Plans**

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.

N/A

\_\_\_\_\_

\_\_\_\_\_

#### **VI. Proposed Impacts to Waters of the United States/Waters of the State**

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: Minor Permanent impacts from the placement of the bridge bends, and minor temporary impacts from workpads.

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
N/A					
Total Wetland Impact (acres)					

3. List the total acreage (estimated) of all existing wetlands on the property: N/A

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
1	North Toe River	temporary	Perennial	180		0.353
1	North Toe River	Permanent	Perennial	180		<0.01
Total Stream Impact (by length and acreage)						>0.353

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
N/A				
Total Open Water Impact (acres)				

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.353 temp. & <0.01 perm.
Wetland Impact (acres):	N/A
Open Water Impact (acres):	N/A
Total Impact to Waters of the U.S. (acres)	N/A
Total Stream Impact (linear feet):	0.353 temp. & <0.01 perm.

7. Isolated Waters

Do any isolated waters exist on the property? ☐ Yes ☒ No

Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.

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8. Pond Creation

If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.

Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands

Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A

Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): \_\_\_\_\_

Current land use in the vicinity of the pond: \_\_\_\_\_

Size of watershed draining to pond: \_\_\_\_\_ Expected pond surface area: \_\_\_\_\_

## **VII. Impact Justification (Avoidance and Minimization)**

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. In order to minimize impacts to water resources, NCDOT “Best Management Practices for the Protection of Surface Waters” will be strictly enforced for the project.

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## **VIII. Mitigation**

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ’s Draft Technical Guide for Stream Work in North Carolina, available at <http://h2o.enr.state.nc.us/ncwetlands/strmgide.html>.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.

N/A

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2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are will to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP website at <http://h2o.enr.state.nc.us/wrp/index.htm>. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): N/A

Amount of buffer mitigation requested (square feet): N/A

Amount of Riparian wetland mitigation requested (acres): N/A

Amount of Non-riparian wetland mitigation requested (acres): N/A

Amount of Coastal wetland mitigation requested (acres): N/A

## **IX. Environmental Documentation (required by DWQ)**

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐
2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)?  
Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation.  
Yes ☒ No ☐
3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐



**X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)**

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify \_\_\_\_\_)? Yes ☐ No ☒
2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3 (2 for Catawba)	
2		1.5	
Total			

\* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**XI. Stormwater (required by DWQ)**

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level. See attached Stormwater Management Plan  
\_\_\_\_\_  
\_\_\_\_\_

**XII. Sewage Disposal (required by DWQ)**

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.

N/A

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**XIII. Violations (required by DWQ)**

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?

Yes ☐

No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

**XIV. Cumulative Impacts (required by DWQ)**

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒

If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at <http://h2o.enr.state.nc.us/newetlands>. If no, please provide a short narrative description: \_\_\_\_\_

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**XV. Other Circumstances (Optional):**

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

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**Applicant/Agent's Signature**

**Date**

(Agent's signature is valid only if an authorization letter from the applicant is provided.)

# **STORMWATER MANAGEMENT PLAN**

October 3, 2006

Project: 32728.1.1 (B-2848)

Brunswick County, North Carolina

Hydraulics Project Engineer: Henry Wells, PE

NCDOT Hydraulics Project Engineer: Marshall W. Clawson, PE

## **Project Description:**

This project consists of replacing NCDOT Bridge #143 over North Toe River on SR 1304. The existing 367 foot long bridge with a 12 lane, which will be replaced on new location just up stream of the existing bridge with a 365 foot long bridge. The overall length of the project including the bridge, approaches, L-line and Y- line improvements is 1241 feet.

## **Environmental Description**

This project is located in the French Broad River Basin. This bridge crosses a portion of the North Toe River, which is inhabited by the Appalachian Elktoe. . The North Carolina Department of Environment and Natural Resources classifies the North Toe River as "C Tr". No wetlands are located on this project. No buffers were located in the vicinity of this project.

## **Roadway Description:**

The proposed roadway bridge approaches will have 10 foot lanes and 2 foot paved shoulders. The project drainage system consists of grated inlets and associated pipe systems.

## **Best Management Practices and Major Structures:**

- **Major Structure**

A bridge will be placed from -L- Station 10+15 to -L- Station 13+80. In accordance with current guidelines, the bridge is designed so that the spill-thru abutments or vertical abutment are located a minimum of 10 feet from the top of bank on the line backside of the bridge. The bents in the channel were minimized. The existing bridge had three bents in the channel, while the proposed bridge has only one. The bridge is also designed so that no deck drains will be used in order to stop any direct discharges into North Toe River. All deck drainage will be picked up by a deck drainage system and discharged into a preformed scour hole.

- **Grass Lined Ditches**

Grass lined ditches were used where possible to further filter pollutants from highway runoff prior to the runoff into the North Toe River.

**Design Details:**

Design details for the preformed scour hole is shown in the Roadway Design plans.



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

July 6, 2006

Mr. John F. Sullivan, III  
Division Administrator  
Attention: Mr. Rob Ayers, Area Engineer  
Federal Highway Administration  
310 New Bern Avenue, Suite 410  
Raleigh, North Carolina 27601-1441

Dear Mr. Sullivan:

Subject: Bridge Replacements over the Toe River (Projects B-1443 and B-2848) in Yancey and Mitchell Counties, North Carolina, and Their Effects on the Federally Endangered Appalachian Elktoe and Its Designated Critical Habitat

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the Biological Assessment (BA) on the effects of the subject bridge replacements on the Appalachian elktoe and its designated critical habitat in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

This Opinion is based on information provided in the May 12, 2005, BA; supplemental information to the BA (requested June 23, 2005, and received February 21, 2006); other available literature; personal communications with experts on the federally endangered Appalachian elktoe (*Alasmidonta raveneliana*); and other sources of information. A complete administrative record of this consultation is on file at this office.

In the BA, you determined that the following federally listed species would not be affected by the proposed bridge replacements: Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), Indiana bat (*Myotis sodalists*), Eastern cougar (*Puma concolor cougar*), spruce-fir moss spider (*Microhexura montivaga*), Virginia spiraea (*Spiraea virginiana*), spreading avens (*Geum radiatum*), Heller's blazing star (*Liatris helleri*), Roan Mountain bluet (*Hedyotis purpurea* var. *montana*), Blue Ridge goldenrod (*Solidago spithamea*), and rock gnome lichen (*Gymnoderma lineare*). In view of the information in the BA, we concur with your determination that the bridge replacement projects will have no effect on these species. Therefore, we believe the requirements under

section 7 of the Act are fulfilled for these species. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Migratory Birds – Swallows were observed nesting at bridge B-2848. The Migratory Bird Treaty Act (16 U.S.C. 703-712) prohibits the taking, killing, possession, transportation, and importation of migratory birds (including the bald eagle), their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Both bridges should be inspected for nesting migratory birds. The North Carolina Department of Transportation (NCDOT) should avoid impacting the nests during the migratory bird nesting season of March through September. Therefore, if birds are discovered nesting on the bridges, demolition of the bridges should take place outside this nesting season. If it is not possible to demolish the bridges outside the nesting season, the NCDOT should work, in consultation with us, to develop measures to discourage birds from establishing nests on the bridges by means that will not result in the take of birds or eggs.

## **CONSULTATION HISTORY**

A consultation history of this project is provided in Appendix A.

## **BIOLOGICAL OPINION**

### **I. DESCRIPTION OF THE PROPOSED ACTION**

As defined in the Service's section 7 regulations (50 CFR 402.02), "action" means "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas." The action area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area. This Opinion addresses only those actions from which the Service believes adverse effects may result. In their BA, the NCDOT outlined those activities involved in the construction and demolition of two bridges (Projects B-1443 and B-2848) that would affect the Appalachian elktoe and its designated critical habitat. The NCDOT also considered the effect of their proposal to protect at least 3,000 linear ft of 100-ft riparian buffers along the Toe, North Toe, and Cane Rivers. This Opinion addresses whether replacing these existing bridges is likely to jeopardize the continued existence of the Appalachian elktoe or adversely modified its designated critical habitat.

The NCDOT has determined that the subject two bridges are deficient because of deteriorating structural integrity and are functionally obsolete due to narrow roadway

geometry and substandard design. The proposed action calls for the NCDOT to replace and demolish Bridge Nos. 61 and 143 over the Toe River as follows:

**Project B-1443** - The existing Bridge No. 61 over the Toe River on SR 197 was constructed in 1925 and is a continuous reinforced concrete closed-spandrel arch structure. It is comprised of five spans, is 270 feet (ft) in length, has a roadway width of 15.6 ft, and has two piers within the river channel totaling an area of 151.2 ft<sup>2</sup>. Six alternatives to replacing the bridge were considered, including five build alternatives. The chosen alternate will require the least amount of roadway approach construction and was designed to minimize impacts to the river. The new bridge will be on a new alignment, approximately 180 ft upstream of the existing bridge. It will be approximately 360 ft in length and 36 ft wide and will require two piers to be placed in the river, which will result in 57 ft<sup>2</sup> of fill within the channel. Improvements to the approach roadways will be required for a distance of approximately 213 ft to the south and 59 ft to the north. Traffic will be maintained on the existing bridge during construction.

The use of temporary bridges for construction and demolition activities is not feasible for this project due to the amount of bedrock present at the construction site. A drilled shaft structure will need to be used for any type of bridge at this site since the presence of bedrock makes pile driving impossible. Given the deteriorated condition and small size of the existing bridge, it is not possible to work from the existing bridge to construct the new bridge. Therefore, rock causeways will be required to construct the new bridge and demolish B-1443. The temporary construction/demolition causeways used for the project were designed to result in the least amount of fill in the river while providing sufficient area to accomplish the construction and demolition. The rock causeways will consist of a base of clean class II riprap, with about 1 ft of clean class I riprap on top of the causeways. The causeways will be constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 50 percent of the river will be open. Constructing the piers for the new bridge and demolishing the existing bridge causeways will result in 4,972 ft<sup>2</sup> and 3,993.4 ft<sup>2</sup> of temporary rock fill in the river, respectively.

Concrete arch bridges are difficult to demolish because, when trying to dismantle the bridge, the entire structure acts as one piece. Historically, the preferred method of demolition for concrete arch bridges was removal with explosives. This method of demolition caused the entire structure to drop into the waterway. To minimize impacts from the bridge demolition and reduce the potential for the entire bridge to fall into the river, the NCDOT has proposed that the contractor construct a support frame at the existing bridge (as discussed later in this document, the contractor will be required to submit for approval a demolition plan that provides construction and demolition techniques that provide equal to or fewer impacts than described in the BA). Temporary support frames will be placed in the river under each arch. The support frame foundation will most likely be precast concrete (such as a concrete barrier), but the contractor may choose to use a timber or steel foundation. Due to the irregular rock streambed, small amounts of riprap or sandbags may be required to level up the support frame foundation.

**Project B-2848** - The existing Bridge No. 143 over the Toe River on SR 1304 was constructed in 1922 and is a reinforced concrete spandrel arch structure. The bridge consists of earth-filled spandrel piers. It is comprised of five spans, is 367 ft in length, has a roadway width of 12 ft, and has three piers within the river channel totaling an area of 349 ft<sup>2</sup>. Five alternatives to replacing the bridge were considered, including three build alternatives. The chosen alternative will have less impact on the natural environment than the other two build alternatives and will avoid impacting a tributary to the Toe River. The new bridge will be on a new alignment, approximately 50 ft downstream of the existing bridge. It will be approximately 366 ft in length and 24 ft wide. It will require one bent, consisting of two drilled piers totaling 32.0 ft<sup>2</sup>, and another bent with similar dimensions will be constructed at the water's edge on the east bank of the river.

As with B-1443, the use of temporary bridges for construction and demolition activities is not feasible for this project due to the amount of bedrock present at the construction site. The rock causeways that will be required to construct the new bridge and demolish B-2848 were also designed to result in the least amount of fill in the river while providing sufficient area to accomplish the construction and demolition. The rock causeways will consist of a base of clean class II riprap, with about 1 ft of clean class I riprap on top of the causeways. The causeways will be constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 52 percent of the river will be open. Constructing the piers for the new bridge and demolishing the existing bridge causeways will result in 15,551 ft<sup>2</sup> and 1,786 ft<sup>2</sup> of temporary rock fill in the river, respectively.

The NCDOT will also use support frames, as described for the demolition of B-1443, to minimize impacts from the bridge demolition and reduce the potential for the entire bridge to fall into the river. In addition to the difficult nature of demolishing concrete arch bridges, the piers at B-2848 are also filled with earthen material. The NCDOT has proposed the removal of this fill in the initial steps of the demolition process to ensure that the fill material does not enter the river.

#### **A. Action Area**

The action area for this Opinion includes the areas directly impacted by construction activities; the areas potentially impacted by indirect impacts; a 100-ft (500-meter [m]) boundary around each bridge site, which includes 1,312 ft (400 m) downstream and 328 ft (100 m) upstream of both the existing and newly constructed bridges; and the areas the NCDOT is considering for riparian buffer preservation and/or restoration along the Toe, North Toe, and Cane Rivers to help offset impacts from the project. Therefore, the project area includes the main stem of the North Toe River, Toe River, and Cane River in Mitchell and Yancey Counties, North Carolina (see attached Figures 1 and 2).



Physical Characteristics within the Action Area - The South Toe River and North Toe River combine near the Town of Spruce Pine to form the Toe River; the Toe River then combines with the Cane River to form the Nolichucky River, a tributary to the French Broad River. The North Toe River originates in central Avery County, approximately 5 miles northeast of Newland. From Newland the river flows east for approximately 4 miles to Minneapolis. The river generally flows in a southwest direction from Minneapolis, through the city of Spruce Pine in Mitchell County, until its confluence with the South Toe River near Kona, forming the Toe River. The Toe River continues to flow northwest along the Mitchell/Yancey County border through Toecane and Relief until its confluence with the Cane River near Hunt Dale. The headwaters of the Cane River arise in Mount Mitchell State Park in Yancey County. The Cane River flows generally south for approximately 40 miles before joining the Toe River near Hunt Dale to form the Nolichucky River.

The Nolichucky River watershed occupies parts of two physiographic provinces. Upstream parts of the watershed (upstream from about Dry Creek, at river mile 87.5) and the higher slopes along the eastern side of the river are in the Blue Ridge Province. The remainder of the watershed and most of the length of the Nolichucky River are located in the Valley and Ridge Province. The approximately one-third of the watershed that is located in the Blue Ridge Province consists of high, steep ridges with narrow valleys. The mountains in this part of the watershed rise 1,000 to 2,500 ft above the adjacent lowlands. The western part of the Blue Ridge Province is characterized by long, narrow individual ridges, aligned parallel to the trend of the range and similar to the more subdued ridges of the Valley and Ridge Province. The main mountain mass along the Tennessee/North Carolina state line is a tumbled confusion of peaks and valleys that appear to have no regular pattern.

Land Use - Most of the land in the action area is forested, with a large portion of it occurring within the Pisgah National Forest. A significant portion of land, mostly along the alluvial areas of the middle North Toe River, South Toe River, and Toe River, is residential/golf course (<1 percent) or cultivated cropland and pasture (14 percent) (North Carolina Department of Environment and Natural Resources [NCDENR] 2005). Historically, the economy of the entire Nolichucky River subbasin depended on natural resources. The mining of mica, feldspar, kaolin, or olivine in the Spruce Pine mining district within the North Toe and South Toe watersheds was the main source of income for the area.

Ecological Significance – The Nolichucky River subbasin is known to support a number of rare fish and freshwater mussel species (Table 1). The stonecat (*Noturus flavus*) is found only in North Carolina in the Nolichucky and Little Tennessee River watersheds. The Cane River contains several rare animals, the most notable of which is almost the entire North Carolina population of sharphead darter (*Etheostoma acuticeps*). The lower stretches of the North Toe and Nolichucky Rivers provide habitat for the olive darter (*Percina squamata*), logperch (*Percina caprodes*), and tangerine darter (*Percina aurantiaca*), as well as the federally endangered Appalachian elktoe mussel. The wavy-rayed lampmussel (*Lampsilis fasciola*) and the hellbender

<b>Table 1. Rare Aquatic Species in the North Toe, Toe, and Cane Rivers.</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>North Carolina Status</b>	<b>Federal Status</b>
<b>Mussels:</b>			
<i>Alasmidonta raveneliana</i>	Appalachian elktoe	Endangered	Endangered
<i>Lampsilis fasciola</i>	Wavy-rayed lampmussel	Special Concern	None
<b>Amphibians:</b>			
<i>Cryptobranchus alleganiensis</i>	Hellbender	Special Concern	Federal Species of Concern
<b>Fishes:</b>			
<i>Etheostoma acuticeps</i>	Sharphead darter	Threatened	Federal Species of Concern
<i>Etheostoma vulneratum</i>	Wounded darter	Special Concern	Federal Species of Concern
<i>Percina squamata</i>	Olive darter	Special Concern	Federal Species of Concern
<i>Noturus flavus</i>	Stonecat	Endangered	None

(*Cryptobranchus alleganiensis*) have been found in the same reaches of the upper Nolichucky River subbasin where the Appalachian elktoe occurs.

The North Carolina Natural Heritage Program (NCNHP) maintains a database of rare plant and animal species, as well as significant natural areas, for the State of North Carolina. Natural areas (sites) are inventoried and evaluated on the basis of rare plant and animal species, rare or high-quality natural communities, and geological features occurring in the particular site. These sites are rated with regard to national, state, and regional significance. The aquatic habitat of the South Toe, a portion of the North Toe, the Toe, and the Nolichucky River is considered to be of “National Significance,” and the aquatic habitat of the Cane River is considered to be of “Statewide Significance.”

Water Quality Assessment and Best Usage Classification - Historically, sedimentation and pollution from several mining operations throughout the Nolichucky River subbasin (primarily in the North Toe watershed) significantly degraded cool-warm water habitats (North Carolina Wildlife Resources Commission [NCWRC] 2005). Feldspar, mica, and kaolin have been extensively mined in this watershed in North Carolina since the early 1900s (Muncy 1981). Nearly half of the nation’s mica is produced in this region. Sedimentation from mining and agricultural practices in the subbasin is well documented (Tennessee Valley Authority [TVA] 1981, Ahlstedt and Rashleigh 1996). However, the North Carolina Mining Control Act of 1971 and the Sedimentation and Pollution Control Act of 1973 have helped improve the water

quality of this basin (NCDENR 2003, Ahlstedt and Rashleigh 1996). Recent bioassessments, including benthic macroinvertebrate and fish sampling, in the Nolichucky River subbasin by the North Carolina Division of Water Quality (DWQ) indicate improving conditions in the subbasin (Tables 2 and 3).

While the sampling conducted by DWQ indicates that water quality is generally good in the subbasin (based on the parameters that are sampled and evaluated by the DWQ), there are still areas of concern. Mining impacts are still widespread, while croplands for corn, tomatoes, and burley tobacco, along with development, contribute to nonpoint-source pollution, including pesticides, fertilizers, oil, heavy metals, animal waste, and eroded sediment, that are washed from land or paved surfaces when it rains. Overall, sedimentation has been considered a significant problem in the Nolichucky River system for many years. Habitat in the North Toe River between Spruce Pine and its confluence with the South Toe River continues to be degraded, seemingly from discharges and runoff from mining operations and the town of Spruce Pine. Floodplain gravel mining in the upper Cane River watershed, both permitted and unpermitted actions, presents a potential threat to long-term channel stability and habitat quality. Development is increasing throughout much of the subbasin, and erosion and sedimentation may also be on the rise. Portions of the subbasin may also be impacted by the direct, indirect, and secondary impacts associated with road construction activities as a result of the expansion of NC 19 from Burnsville to Spruce Pine (NCWRC 2005).

The NCDENR assigns a best usage classification<sup>1</sup> to all the waters of North Carolina. These classifications provide for a level of water quality protection to ensure that the designated usage of that water body is maintained. The portions of the Toe River, Cane River, and North Toe River that are occupied by the Appalachian elktoe have a “Class C, Trout,” usage classification, and the Nolichucky River from its source to the North Carolina/Tennessee state line has a usage classification of “Class B.”

Point-source Pollution - Point-source discharge is defined as discharges that enter surface waters through a pipe, ditch, or other well-defined point of discharge. These

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<sup>1</sup> **15A NCAC 02B.0101 GENERAL PROCEDURES:** (c) Freshwater shall be assigned to one of several classifications, including: (1) Class C: freshwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife (All freshwaters shall be classified to protect these uses at a minimum); or (2) Class B: freshwaters protected for primary recreation which includes swimming on a frequent or organized basis and all Class C uses. Section (e) describes supplemental classification, as: (1) Trout waters: freshwaters protected for natural trout propagation and survival of stocked trout. (4) Outstanding Resource Waters (ORW): unique and special waters of exceptional state or national recreational or ecological significance which require special protection to maintain existing uses. (5) High Quality Waters (HQW): including waters which are rated as excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, native and special native trout waters (and their tributaries) designated by the [North Carolina] Wildlife Resources Commission. (7) Unique wetland (UWL): wetlands of exceptional state or national ecological significance which require special protection to maintain existing uses. These wetlands may include wetlands that have been documented to the satisfaction of the Commission as habitat essential for the conservation of state or federally listed threatened or endangered species.

**Table 2. DWQ Benthic Macroinvertebrate Sampling Results in the Nolichucky River Subbasin (DWQ 2003).<sup>2</sup>**

<b>Water Body</b>	<b>County</b>	<b>Location</b>	<b>1997/2002 Survey Results</b>
Toe River	Mitchell	SR 1321	Good/Good
Toe River	Yancey	SR 1314	Good/Good
North Toe River	Avery	US 19E	Good/Good
North Toe River	Mitchell	SR 1162	Fair/Good
Big Crabtree Creek	Mitchell	US 19E	Excellent/Excellent
South Toe River	Yancey	SR 1167	Excellent/Excellent
Big Rock Creek	Mitchell	NC 197	Good/Excellent
Jacks Creek	Yancey	SR 1337	Fair/Fair
Pigeonroost Creek	Mitchell	SR 1349/NC 197	Excellent/Excellent
Cane River	Yancey	US 19E	Excellent/Excellent
Bald Mountain Creek	Yancey	SR 1408	Good/Excellent
Price Creek	Yancey	SR 1126	Good/Fair/Good

include municipal (city and county) and industrial wastewater treatment facilities, small domestic discharging treatment systems (i.e., schools, commercial offices, subdivisions, and individual residences), and storm-water systems from large urban areas and industrial sites. The primary substances and compounds associated with point-source discharge include nutrients, oxygen-demanding wastes, and toxic substances (such as chlorine, ammonia, and metals).

Under Section 301 of the Clean Water Act of 1977 (CWA), the discharge of pollutants into surface waters is regulated by the Environmental Protection Agency. Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permitting program, which delegates permitting authority to qualifying states. In North

<sup>2</sup>Water quality monitoring programs have been implemented by the DWQ to assess water quality trends in North Carolina Waters. One method used is the monitoring of benthic macroinvertebrates to assess water quality by sampling for selected benthos organisms. The species and overall biomass, as well as the presence of various groups intolerant of water quality degradation, are reflections of water quality. A biodiversity rating is given to a water body sampled, based on the taxa richness of the stream, and a qualitative sampling for intolerant forms such as mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera), collectively referred to as EPT. Biodiversity ratings include: Excellent, Good, Good-Fair, Fair, and Poor. Excellent and Good ratings indicate that the best usage classification for that stream is being supported (S). A rating of Good-Fair indicates that the usage is supported but is threatened (ST). A Fair rating relates to a partial support (PS) of the best usage, and a Poor rating indicates that the best usage classification for that stream is not being supported (NS).

**Table 3. Tennessee Valley Authority Fish Community Assessment in the Nolichucky River Subbasin (DWQ 2003).<sup>3</sup>**

<b>Water Body</b>	<b>County</b>	<b>Location</b>	<b>Date</b>	<b>Score/Rating</b>
North Toe River	Mitchell	US 19	1999	50/Good
North Toe River	Yancey	NC 80	1997 1999	40/Good 50/Good
Toe River	Avery	SR 1314	1997 1999	40/Fair 56/Good-Excellent
Toe River	Mitchell	SR 1336	1997	48/Good
South Toe River	Mitchell	NC 80	1997	48/Good
Little Crabtree Creek	Yancey	US 19E	1997 1999	44/Fair 40/Fair
Cane Creek	Mitchell	NC 80	1997 1999	32/Poor 34/Poor
Big Rock Creek	Mitchell	NC 197	1997 2000	50/Good 50/Good
Jacks Creek	Yancey	SR 1336	2000	40/Fair
Cane River	Yancey	US 19E	1997 2000	44/Fair 50/Good
Cane River	Yancey	US 19W	1997 2000	40/Fair 48/Good
Cane River	Yancey	US 19W	1997	46/Fair-Good
Nolichucky River	Mitchell	SR 1321	1997 2002	50/Good 52/Good

Carolina, the NCDENR's DWQ is responsible for permitting and enforcement of the NPDES program. There were 23 NPDES permitted discharges in the subbasin in 2003 (NCDENR 2005), although additional discharges have been permitted recently (a new wastewater treatment plant [WWTP] discharge into the South Toe below Highway 19E). Most of these discharges are small WWTPs that serve schools or subdivisions, including the Spruce Pine WWTP, Newland WWTP, Bakersville WWTP, and multiple mining process discharges, including Unimin's four discharges.

Nonpoint-source Pollution – Nonpoint-source pollution refers to runoff that enters surface waters through storm water or snowmelt. There are many types of land-use

<sup>3</sup>The Fish Community Assessment assigns an Index of Biotic Integrity (IBI), which is another method of assessing water quality. The IBI evaluates species richness and composition, trophic composition, and fish abundance and condition.

activities that are sources of nonpoint-source pollution, including land development, construction activity, animal waste disposal, mining, and agriculture and forestry operations, as well as impervious surfaces, such as roadways and parking lots. Various nonpoint-source management programs have been developed by a number of agencies to control specific types of nonpoint-source pollution (e.g., forestry, pesticide, urban, and construction-related pollution). Each of these management programs develops Best Management Practices (BMP) to control the specific type of nonpoint-source pollution.

The Sedimentation and Erosion Control Program (SECP) applies to construction activities, such as roadway construction, and is established and authorized under the Sedimentation Pollution Control Act of 1973. This act delegates the responsibility for its administration and enforcement to the NCDENR's Division of Land Resources (DLR) (Land Quality Section). The SECP requires, prior to construction, the submission and approval of erosion-control plans on all projects disturbing one or more acres. On-site inspections by DLR are conducted to determine compliance with the plan and to evaluate the effectiveness of the BMP that are being used. The NCDOT, in cooperation with the DWQ, has developed a sedimentation-control program for highway projects, which adopts formal BMP for the protection of surface waters. Additional erosion-control measures, as outlined in Design Standards in Sensitive Watersheds (NCAC T15A:04B.0124), are implemented by the NCDOT for projects within WS-I or WS-II water supply watersheds, critical areas, waters designated for shellfishing, or any waters designated by the DWQ as High Quality Waters. When crossing an aquatic resource containing a federally listed species, the NCDOT has committed to implement erosion-control guidelines that go beyond both the standard BMP, as well as the Design Standards in Sensitive Watersheds, regardless of the DWQ classification. These areas are designated as "Environmentally Sensitive Areas" on the erosion-control plans.

## **B. Conservation Measures**

Conservation measures represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. The beneficial effects of conservation measures are taken into consideration in the Service's conclusion of a jeopardy versus a nonjeopardy opinion and in the analysis of incidental take. However, such measures must minimize impacts to listed species within the action area in order to be factored into the Service's analyses.

The following conservation measures are proposed by the NCDOT to avoid and/or minimize potential impacts from construction and demolition activities to the Appalachian elktoe. These measures have been incorporated into the design and implementation plans for the bridge replacement projects.

### **Conservation Measures for Bridge Design**

1. Deck drains will be placed at the ends of the replacement bridges. Storm water will be directed into catch basins and will then flow through a vegetated buffer so that no drainage will occur over the Toe River. Currently, drainage from the decks of both the existing structures flows directly into the river. Storm water coming off the approaching roadways at the bridge locations will be managed in a similar manner. These commitments have been incorporated in the Structure Design Plans for each project.
2. The replacement of B-1443 will result in two piers placed within the river, the same number of piers as the existing bridge; however, the piers of the new bridge will impact 57 ft<sup>2</sup> of the riverbed, while the existing bridge piers are over two and a half times that size--151.2 ft<sup>2</sup>. The replacement of B-2848 will reduce the number of piers within the water as well as the area of impact to the riverbed. The existing bridge has three piers within the river channel, totaling an area of 349 ft<sup>2</sup>, whereas the new bridge will require one bent, consisting of two drilled piers totaling 32.0 ft<sup>2</sup> and another bent with similar dimensions at the water's edge on the east bank of the river. The reduction in the area and the number of piers in the Toe River is expected to reduce the bridges' effects on stream-flow patterns at these sites.

### **Conservation Measures for Bridge Construction**

1. The NCDOT will remove Appalachian elktoes from the impact site and relocate them to suitable locations upstream of the impacted areas in the North Toe River, at river mile 25.5, according to the procedures in the approved relocation plan in the BA.
2. In addition to relocating all mussels found in the footprint of the impact area, the NCDOT will conduct final mussel surveys in the project footprint just prior to construction and will move any additional mussels found to the above-described upstream habitat.
3. North Carolina sedimentation regulations, entitled "Design Standards in Sensitive Watersheds,"<sup>4</sup> will be implemented during the design and construction of the

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<sup>4</sup>**DESIGN STANDARDS IN SENSITIVE WATERSHEDS, 15A NCAC 04B.0124:** (a) Uncovered areas in HQW zones shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres. Only the portion of the land-disturbing activity within a HQW zone shall be governed by this Rule. Larger areas may be uncovered within the boundaries of the tract with the written approval of the Director. (b) Erosion and sedimentation control measures, structures, and devices within HQW zones shall be so planned, designed and constructed to provide protection from the runoff of the 25 year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agricultural Soil Conservation Service's "National Engineering Field Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association. (c) Sediment basins within HQW zones shall be designed and constructed such that the basin will have a settling efficiency of at least 70 percent for the 40 micron (0.04 mm) size soil particle transported into the basin by the runoff of that two-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agriculture Soil Conservation Services "National Engineering Field

projects, as applicable. In addition to these standards, erosion-control measures for environmentally sensitive areas will be implemented and will:

- a. Identify areas adjacent to the Toe River as “Environmentally Sensitive Areas” on the erosion-control plans for this project;
- b. Provide a 50-ft buffer zone (each side of the stream), allowing clearing but not grubbing until immediately before grading operations;
- c. Limit grubbing operations to within 10 days of grading;
- d. Require “seeding and mulching” to be performed immediately following grade establishment;
- e. Require “staged seeding”--20-ft fill sections or 2 acres, whichever is less;
- f. Clean erosion and sediment control measures when half full;
- g. Increase sediment storage capacity above standard BMP guidelines; the amount of increase will be determined during the preconstruction meetings.

#### **Conservation Measures for Bridge Demolition**

The contractor will be required to submit for approval a demolition plan to the Resident Engineer and the Bridge Construction Engineer prior to beginning bridge removal. This plan must be sealed by a registered North Carolina Professional Engineer. The plan must use demolition techniques that minimize the amount of debris that will enter the river and may include procedures similar to those listed below. If the contractor provides procedures that do not follow those described below, they will be reviewed for approval by the NCDOT Resident Engineer and Bridge Construction Engineer and the Service and must be techniques that provide equal to or fewer impacts than described below.

1. Prior to bridge demolition, all the asphalt-wearing surface will be removed from the deck in a manner that prohibits material from entering the river. Approved removal techniques include milling or scrapping with a backhoe bucket. Depending on the technique used, containment headers may be required. Typically, this consists of

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Manual for Conservation Practices” or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association. (d) Newly constructed open channels in HQW zones shall be designed and constructed with side slopes no steeper than two horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners. In any event, the angle for side slopes shall be sufficient to restrain accelerated erosion. (e) Pursuant to G.S. 113A-57(3) provisions for a ground cover sufficient to restrain erosion must be provided for any portion of a land-disturbing activity in a HQW zone within 15 working days or 60 calendar days following completion of construction or development, whichever period is shorter.



vertical boards attached to the bottom of concrete barrier rail to prevent material from spilling into the river during removal.

2. For B-2848 the fill material within the piers will then be removed. The NCDOT has proposed that the contractor conduct the removal of the fill material by the following process: a backhoe will load the material into dump trucks, working from one end of bridge to the other. After as much fill material as possible is removed with the machinery, the rest of the material will be removed manually (by shovel). The manual removal of the deepest areas of the piers may have to occur after the upper portions of the pier have been removed.
3. For B-1443 the next step of the demolition process will be to remove all the concrete rail and deck by saw-cutting or nonshattering methods. This material will be removed from the bridge without dropping material into the stream. For B-2848 the existing steel beam guardrail will be removed by unbolting and cutting as needed.
4. At this time in the demolition process the bridge superstructure of B-1443 will consist of the concrete arches connected by small concrete beams (concrete diaphragms). The B-2848 superstructure will consist of concrete arches connected by a solid concrete floor. Portions of the concrete deck will be removed by saw-cutting and lifting out large pieces. Removing portions of the floor will reduce the weight of the structure for the next step of demolition. However, like the concrete diaphragms, some portion of the floor must remain to keep the arches from separating.
5. At this point in the demolition process the remaining portion of the bridge will be dismantled; every attempt will be made to prevent components of the bridge from dropping into the river. Temporary support frames will be placed in the river under each arch. The support frame foundation will most likely be precast concrete (such as a concrete barrier), but the contractor may choose to use a timber or steel foundation. Due to the irregular rock streambed, small amounts of riprap or sandbags may be required to level up the support frame foundation. Support frames will need to be placed in at least three locations under each arch (midspan and quarter points). The arches will then be sawed into sections and an attempt will be made to lift these sections out with a crane. The arches could potentially separate, and all or a portion of them could fall into the river. The contractor's demolition plan will detail the maximum amount of the bridge that can be safely removed. Any portion that falls into the stream will be lifted out with a crane.
6. The proposed causeways will be used as access for bent removal. Equipment will need to be staged adjacent to the bent in order to facilitate sawing it into manageable sections above water elevation. Cranes on the causeways will lift the sections out. Once the bents have been removed to water elevation, the remaining mass of concrete will be removed to streambed elevation by underwater sawing or the use of a hoe ram to break the bent at streambed interface to allow for lifting it

out as a unit. During this process, turbidity curtains will be used (if water depth is sufficient), and the disturbance of the stream bottom will be limited to an area 3 ft around the perimeter of the bent. The existing footing below streambed will be left in place to avoid additional streambed disturbance.

7. The temporary causeways used for the project were designed to result in the least amount of rock fill entering the river while providing sufficient area to accomplish the construction and demolition. The causeways will be constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan so that not all causeways needed for construction and demolition are in the river at the same time, minimizing impacts to the flow of the river. The use of Jersey-type or similar barrier devices will be installed around the perimeter of the causeways to help contain the stone used to construct the causeways.
8. The use of explosives will not be allowed.
9. Saw slurry must be contained by approved vacuum methods.

#### **Additional Conservation Measures**

1. In order to avoid and minimize environmental impacts associated with these projects, all standard procedures and measures, including the NCDOT's BMP for Construction and Maintenance Activities and the TVA's Water Management Standard Conditions will be strictly enforced during the project. Provisions to preclude contamination by toxic substances during the project will also be strictly enforced.
2. The NCDOT proposes to relocate all native mussels, including the Appalachian elktoe, from the footprints and extending downstream 262 ft (80 m) and upstream 66 ft (20 m) of the two bridge replacement projects. The procedure for the relocation is detailed in the BA. The relocation procedure within the BA provides a plan that relocates freshwater mussels in such a way as to reduce stress and minimize the risk of injury while the species are in transit. If at any time during the relocation it is determined that these procedures are not meeting the stated objectives, more stringent methods may be developed, in cooperation with the NCWRC and the Service, to ensure that the mussels are relocated successfully. During August 2005 the NCDOT, NCWRC, Catena Group, and Service worked together to choose a suitable relocation site. It was decided that the mussels from both bridge sites would be moved to suitable habitat within the upstream limits of the Appalachian elktoe's distribution. Concentrating mussels in a location within the upper limits of its distribution, where numbers are currently very low, may help facilitate the continued up-river recruitment trend of the species. The most suitable site was determined to be on the North Toe River, between Penland and Boonford, at approximately river mile 25.5. The relocation site will be monitored for the survival of relocated mussels and the movement of mussels a month after they have

been removed from the defined salvage areas. The relocation site will then be monitored for recovery, survival (of recovered mussels), movement, and growth of mussels once a year for 5 years after the project is constructed.

3. The NCDOT has initiated a watershed search for potential riparian properties within the Toe River. The NCDOT has investigated approximately five sites consisting of opportunities for 100-ft riparian buffer protection and/or restoration. The NCDOT has committed to purchase (for protection and/or restoration) at least 3,000 linear ft of these riparian buffers sites. Riparian buffers will be purchased to offset unavoidable impacts on the Appalachian elktoe population associated with the bridge construction and demolition.
4. The NCDOT proposes to monitor the river channel and banks at sites upstream, at the construction sites, and downstream to determine changes in habitat resulting from activities at these sites. If any problems with regard to stream stability are detected during the monitoring, the NCDOT has proposed to attempt to correct the problems. This monitoring will also help evaluate the impacts of construction on habitat in the Toe River.
5. The NCDOT has developed erosion-control measures for these two projects specifically to protect the Appalachian elktoe and its habitat. These measures are listed in the “Conservation Measures for Bridge Design” section of this Opinion. In addition to these erosion-control measures, an inspection of the erosion-control devices will be conducted on a daily basis by the Construction Project Inspector positioned in the District Office in which the project occurs. The Roadside Environmental Branch of the NCDOT also has Area Field Operations Engineers who will perform compliance inspections of the erosion-control devices a minimum of twice a month during the life of a project. In addition to these levels of inspection, an environmental specialist with the NCDOT Office of Natural Environment’s Biological Surveys Unit will perform periodic site inspections of the erosion-control measures at the respective construction sites. This person will also be making qualitative assessments of the Toe River habitat at the construction sites. These visits will be unannounced and directly in relationship to rain events whenever possible.
6. The NCDOT Project Development and Environmental Analysis Branch and the Service will be invited to the preconstruction conference to discuss with the contractor the provisions of this Opinion. Prior to construction the contractor will be required to give notification of the construction initiation date to the Service, NCWRC, and TVA.

## II. STATUS OF THE SPECIES AND ITS CRITICAL HABITAT

### A. Species Description, Life History, and Critical Habitat Description

The Appalachian elktoe has a thin, but not fragile, kidney-shaped shell, reaching up to about 3.2 inches (in.) in length, 1.4 in. in height, and 1 in. in width. Juveniles generally have a yellowish-brown periostracum (outer shell surface), while the periostracum of the adults is usually dark brown to greenish-black in color. Although rays are prominent on some shells, particularly in the posterior portion of the shell, many individuals have only obscure greenish rays. The shell nacre (inside shell surface) is shiny, often white to bluish-white, changing to a salmon, pinkish, or brownish color in the central and beak cavity portions of the shell; some specimens may be marked with irregular brownish blotches.

The Appalachian elktoe has been reported from relatively shallow, medium-sized creeks and rivers with cool, clean, well-oxygenated, moderate- to fast-flowing water. The species is most often found in riffles, runs, and shallow flowing pools with stable, relatively silt-free, coarse sand and gravel substrate associated with cobble, boulders, and/or bedrock (Gordon 1991; Service 1994, 1996, 2002). Stability of the substrate appears to be critical to the Appalachian elktoe, and the species is seldom found in stream reaches with accumulations of silt or shifting sand, gravel, or cobble (Service 2002). Individual specimens that have been encountered in these areas are believed to have been scoured out of upstream areas during periods of heavy rain and have not been found on subsequent surveys (Service 2002).

Like other freshwater mussels, the Appalachian elktoe feeds by filtering food particles from the water column. The specific food habits of the species are unknown, but other freshwater mussels have been documented to feed on detritus (decaying organic matter), diatoms (various minute algae) and other algae and phytoplankton (microscopic floating aquatic plants), and zooplankton (microscopic floating aquatic animals). The reproductive cycle of the Appalachian elktoe is similar to that of other native freshwater mussels. Males release sperm into the water column, and the sperm are then taken in by the females through their siphons during feeding and respiration. The females retain the fertilized eggs in their gills until the larvae (glochidia) fully develop. The mussel glochidia are released into the water and, within a few days, must attach to the appropriate species of fish, which they then parasitize for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom where they continue to develop, provided they land in a suitable substrate with the correct water conditions. The banded sculpin (*Cottus carolinae*) was identified as a host species for glochidia of the Appalachian elktoe at the time the elktoe was listed, and the mottled sculpin (*C. bairdi*) was identified as a host species soon after the listing (Service 2002). Dr. Jim Layzer (Tennessee Technological University, unpublished data) has recently identified eight additional species of fish that successfully transformed glochidia of the Appalachian elktoe into juveniles under laboratory condition. These eight species include the wounded darter (*Etheostoma vulneratum*), greenfin darter (*Etheostoma chlorbranchium*), greenside

darther (*Etheostoma blenniodes*), river chub (*Nocomis micropogon*), northern hogsucker (*Hypentilum nigricans*), central stoneroller (*Campostoma anomalum*), longnose dace (*Rhinichthys cataractae*), and rosyside dace (*Clinostomus funduloides*). The life span and many other aspects of the Appalachian elktoe's life history are currently unknown.

Critical habitat was designated for the Appalachian elktoe in 2002 (Service 2002). The areas designated as critical habitat for the Appalachian elktoe total approximately 144.3 miles of various segments of rivers in North Carolina and one river in Tennessee. Critical habitat identifies specific areas that are essential to the conservation of a listed species and that may require special management considerations or protection. Section 7(a)(2) of the Act requires that each federal agency shall, in consultation with the Service, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat.

The following constituent elements are part of the critical habitat designation and are essential to the conservation of the Appalachian elktoe:

1. Permanent, flowing, cool, clean water;
2. Geomorphically stable stream channels and banks;
3. Pool, riffle, and run sequences within the channel;
4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment;
5. Moderate to high stream gradient;
6. Periodic natural flooding; and
7. Fish hosts, with adequate living, foraging, and spawning areas for them.

In the Nolichucky River subbasin, critical habitat is designated for the Appalachian elktoe in the main stem of the Nolichucky River, Cane River, Toe River, South Toe River, and North Toe River.

## **B. Status and Distribution**

The Appalachian elktoe is known only from the mountain streams of western North Carolina and eastern Tennessee. Although the complete historical range of the Appalachian elktoe is unknown, available information suggests that the species once lived in the majority of the rivers and larger creeks of the upper Tennessee River system in North Carolina, with the possible exception of the Hiawasee and Watauga River systems (the species has not been recorded from either of these river systems). In

Tennessee, the species is known only from its present range in the main stem of the Nolichucky River.

Currently, the Appalachian elktoe has a very fragmented, relict distribution. The species still survives in scattered pockets of suitable habitat in portions of the Little Tennessee River system, Pigeon River system, Mills River, and Little River in North Carolina and the Nolichucky River system in North Carolina and Tennessee.

Little Tennessee River Subbasin - In the Little Tennessee River system in North Carolina, populations survive in the reach of the main stem of the Little Tennessee River, between the city of Franklin and Fontana Reservoir, in Swain and Macon Counties (McGrath 1999; Service 1994, 1996, 2002), and in scattered reaches of the main stem of the Tuckasegee River in Jackson and Swain Counties (McGrath 1998; Tim Savidge, NCDOT, personal communication, 2001; Service 2002), from below the town of Cullowhee downstream to Bryson City. Monitoring by the NCWRC of the Appalachian elktoe population in the Little Tennessee River over the last couple of years has revealed that the population is apparently declining. A single live individual and one shell were recorded in 2000 from the Cheoah River, below Santeetlah Lake, in Graham County (Service 2002). Biologists with the NCDOT, U.S. Forest Service, and the Service have recorded up to 11 live Appalachian elktoes from the Cheoah River, below Santeetlah Dam, during surveys of portions of the river in 2002, 2003, 2004, and 2005.

French Broad River Subbasin - In the Pigeon River system in North Carolina, a small population of the Appalachian elktoe occurs in small scattered sites in the West Fork Pigeon River and in the main stem of the Pigeon River, above Canton, in Haywood County (McGrath 1999, Service 2002). The Little River (upper French Broad River system) population of the species, in Transylvania County, North Carolina (Service 2002), is restricted to small scattered pockets of suitable habitat downstream of Cascade Lake. In the Mills River, Henderson County, North Carolina, the Appalachian elktoe occurs in a short reach of the river, from just above the Highway 280 bridge (Savidge, Catena Group, personal communication, 2003) to about 1 mile below the bridge (Jeff Simmons, NCWRC, personal communication, 2004). In addition, NCWRC biologists have recently discovered a few individuals of the species at a site in the main stem of the French Broad River, below the mouth of the Little River (Steve Fraley, NCWRC, personal communication, 2005).

Nolichucky River Subbasin - In the Nolichucky River system, the Appalachian elktoe survives in scattered areas of suitable habitat in the Toe River, Yancey and Mitchell Counties, North Carolina (McGrath 1996, 1999; Service 1994, 1996); the Cane River, Yancey County, North Carolina (McGrath 1997; Service 1994, 1996); and the main stem of the Nolichucky River, Yancey and Mitchell Counties, North Carolina, extending downstream to the vicinity of Erwin, Unicoi County, Tennessee (Service 1994, 1996, 2002). A cooperative and comprehensive mussel survey effort was undertaken between 2000 and 2003 by the NCWRC, NCDOT, NCNHP, and Service throughout the upper Nolichucky River system in Yancey, Mitchell, and Avery

Counties, North Carolina. Given that many areas in the Nolichucky River system had not been surveyed since the 1990s, the primary goal for these surveys was reassessment of the Appalachian elktoe's population status. The survey efforts indicate that suitable habitat within at least 73 miles of stream in the Nolichucky River system is presently occupied by the Appalachian elktoe, an apparent 15-mile increase from reported occupied habitat prior to 2000 (Fraley and Simmons 2004). These surveys also indicate that this population appears to be growing in numbers as well. Sites where mussels were found during 2000 and 2003 produced higher catch per unit effort (CPUE) than the nearest sites sampled prior to 2000 (Fraley and Simmons 2004). However, the available habitat in the subbasin is a limiting factor; therefore, the Appalachian elktoe is not evenly dispersed throughout the 15-mile increase in the subbasin.

During August and September of 2004, significant flooding from Hurricanes Frances and Ivan occurred in the Nolichucky River drainage. The NCWRC surveyed sites in the Nolichucky River drainage for federally listed and state-listed mussels after the hurricanes and compared the results to survey results prior to the hurricanes. As stated previously, based on the results in 2000 and 2003, prior to the 2004 floods, Appalachian elktoe populations in the Nolichucky subbasin were found to be increasing in abundance and expanding their range. The survey results after the floods of 2004 indicate that recovery was set back to some degree based on reduced CPUE results; however, Appalachian elktoes were found throughout most of the occupied range known in 2003, which illustrates the resilience of the species to periodic hydraulic disturbance, especially in a system, such as the Nolichucky River subbasin, that is more prone to habitat disturbance from floods. Currently, the Nolichucky population appears to be a relatively large (at least in terms of spatial distribution) metapopulation that is more or less contiguous, with at least the opportunity for some level of gene flow throughout the subbasin (Fraley and Simmons 2006).

Extirpated Sites - Historically, the species has been recorded from Tulula Creek (Tennessee River drainage), the main stem of the French Broad River at Asheville, and the Swannanoa River (French Broad River system) (Clarke 1981), but it has apparently been eliminated (except from a small section of the main stem of the French Broad River at the confluence of the Little River) from these streams (Service 1994, 1996). There is also a historical record of the Appalachian elktoe from the North Fork Holston River in Tennessee (S. S. Haldeman collection); however, this record is believed to represent a mislabeled locality (Gordon 1991). If the historical record for the species in the North Fork Holston River was accurate, the species has apparently been eliminated from this river as well.

Available information indicates that several factors have contributed to the decline and loss of populations of the Appalachian elktoe and threaten the remaining populations. These factors include pollutants in wastewater discharges (sewage treatment plants and industrial discharges); habitat loss and alteration associated with impoundments, channelization, and dredging operations; and the runoff of silt, fertilizers, pesticides, and other pollutants from land-disturbing activities that were implemented without adequate measures to control erosion and/or storm water (Service 1994, 1996).

Mussels are known to be sensitive to numerous pollutants, including, but not limited to, a wide variety of heavy metals, high concentrations of nutrients, ammonia, and chlorine—pollutants commonly found in many domestic and industrial effluents (Havlik and Marking 1987). In the early 1900s, Ortmann (1909) noted that the disappearance of unionids (mussels) is the first and most reliable indicator of stream pollution. Keller and Zam (1991) concluded that mussels are more sensitive to metals than commonly tested fish and aquatic insects. The life cycle of native mussels makes the reproductive stages especially vulnerable to pesticides and other pollutants (Fuller 1974, Gardner et al. 1976, Ingram 1957, Stein 1971). Effluent from sewage treatment facilities can be a significant source of pollution that can severely affect the diversity and abundance of aquatic mollusks. The toxicity of chlorinated sewage effluents to aquatic life is well-documented (Bellanca and Bailey 1977, Brungs 1976, Goudreau et al. 1988, Tsai 1975), and mussel glochidia (larvae) rank among the most sensitive invertebrates in their tolerance of the toxicants present in sewage effluents (Goudreau et al. 1988). Goudreau et al. (1988) found that the recovery of mussel populations may not occur for up to 2 miles below the discharge points of chlorinated sewage effluent.

Land-clearing and disturbance activities carried out without proper sedimentation and storm-water control pose a significant threat to the Appalachian elktoe and other freshwater mussels. Mussels are sedentary and are not able to move long distances to more suitable areas in response to heavy silt loads. Natural sedimentation resulting from seasonal storm events probably does not significantly affect mussels, but human activities often create excessively heavy silt loads that can have severe effects on mussels and other aquatic organisms. Siltation has been documented to adversely affect native freshwater mussels, both directly and indirectly (Aldridge et al. 1987, Ellis 1936, Kat 1982, Marking and Bills 1979). Siltation degrades water and substrate quality, limiting the available habitat for freshwater mussels (and their fish hosts), thereby limiting their distribution and potential for the expansion and maintenance of their populations; irritates and clogs the gills of filter-feeding mussels, resulting in reduced feeding and respiration; smothers mussels if sufficient accumulation occurs; and increases the potential exposure of the mussels to other pollutants. Ellis (1936) found that less than 1 in. of sediment deposition caused high mortality in most mussel species. Sediment accumulations that are less than lethal to adults may adversely affect or prevent the recruitment of juvenile mussels into the population. Also, sediment loading in rivers and streams during periods of high discharge is abrasive to mussel shells. Erosion of the outer shell allows acids to reach and corrode underlying layers that are composed primarily of calcium, which dissolves under acid conditions (Harman 1974).

The effects of impoundments on mussels are also well-documented. For the most part, lakes do not occur naturally in western North Carolina and eastern Tennessee (most of them are man-made), and the Appalachian elktoe, like the majority of our other native mussels, fish, and other aquatic species in these areas, is adapted to stream conditions (flowing, highly oxygenated water and coarse sand and gravel bottoms). Dams change the habitat from flowing to still water. Water depth increases, flow decreases, and silt accumulates on the bottom (Williams et al. 1992), altering the quality and stability of



the remaining stream reaches by affecting water flow regimes, velocities, temperature, and chemistry. Dams that operate by releasing cold water from near the bottom of the reservoirs lower the water temperature downstream, changing downstream reaches from warm- or cool-water streams to cold-water streams and affecting their suitability for many of the native species historically inhabiting these stream reaches (Miller et al. 1984, Layzer et al. 1993). The effects of impoundments result in changes in fish communities (fish host species may be eliminated) (Brimm 1991) and in mussel communities (species requiring clean gravel and sand substrates are eliminated) (Bates 1962). In addition, dams result in the fragmentation and isolation of populations of species and act as effective barriers to the natural upstream and downstream expansion or recruitment of mussel and fish species.

The information available demonstrates that habitat deterioration resulting from sedimentation and pollution from numerous point and nonpoint sources, when combined with the effects of other factors (including habitat destruction, alteration, and fragmentation resulting from impoundments, channelization projects, etc.), has played a significant role in the decline of the Appalachian elktoe. We believe this is particularly true of the extirpation of the Appalachian elktoe from the Swannanoa River, most of the French Broad River, and long reaches of the Pigeon, upper Little River, and upper Little Tennessee River systems. We believe these factors also have contributed to the extirpation of the species from parts of the upper Tuckasegee River, Cheoah River, and Tulula Creek, though the effects of impoundments are believed to have played an even more significant role in the loss of the species in the upper reaches of these streams.

The most immediate threats to the remaining populations of the Appalachian elktoe are associated with sedimentation and other pollutants (i.e., fertilizers, pesticides, heavy metals, oil, salts, organic wastes, etc.) from nonpoint sources. Much of the Nolichucky River in North Carolina contains heavy loads of sediment, primarily from past land-disturbing activities within its watershed, and suitable habitat for the Appalachian elktoe appears to be very limited in this river system. The species has not been found in the Nolichucky River system in substrates with accumulations of silt and shifting sand; it is restricted to small scattered pockets of stable, relatively clean, and gravelly substrates. The same is true of the other surviving populations of the species.

### **C. Analysis of the Species and Critical Habitat Likely to be Affected**

Species - NCDOT biologists conducted mussel surveys at the two bridge sites on July 24, 1996. The surveys were conducted from a point approximately 1,312 ft (400 m) downstream to 328 ft (100 m) upstream of the existing bridges. A total of five Appalachian elktoes and two wavy-rayed lampmussels were discovered in 2.5 person-hours of survey time at the B-1443 bridge site, totaling a Catch Per Unit Effort (CPUE) of 2 per hour for the Appalachian elktoe. At the B-2848 bridge site, seven Appalachian elktoes and two wavy-rayed lampmussels were found in 3 person-hours of survey time, totaling a CPUE of 2.33 per hour for the Appalachian elktoe.

During the cooperative and comprehensive mussel survey efforts mentioned previously, another mussel survey was conducted at the two bridge sites on September 9, 2002. A total of 11 Appalachian elktoes and 2 wavy-rayed lampmussels were discovered at the B-1443 site in 4 person-hours of survey time, totaling a CPUE of 2.75 per hour for the Appalachian elktoe. At the B-2848 site, 15 Appalachian elktoes and 2 wavy-rayed lampmussels were found in 3.5 person-hours of survey time, totaling a CPUE of 4.28 per hour for the Appalachian elktoe. The survey limits during these surveys were confined to the areas immediately under the existing bridges because previous surveys had documented the species at these sites. The highest CPUE for the Appalachian elktoe during the comprehensive surveys in the basin was 16 per hour (total of 96 individuals); this occurred at a site in the South Toe River (Fraley and Simmons 2004).

Mussel surveys were also conducted in 2002 by Service, NCWRC, and NCDOT personnel in habitats in close proximity to the existing bridges. The purpose of these surveys was to identify potential relocation sites. Neither the exact locations nor the results of those surveys were recorded.

Densities of Appalachian elktoes vary, depending on many factors that cause their distribution pattern to be scattered and difficult to generalize. Based on surveys for Appalachian elktoes from other drainages, the number below the surface is highly variable and dependent on the substrate. In general, mussels can be very difficult to locate in the substrate, and most mussel surveys detect only those specimens located at or on the surface of the substrate. It is likely that additional mussels were present in the survey areas which were overlooked or were not visible on the surface of the stream bottom. It is also potentially likely that fewer mussels are currently present at the site because of impacts from the 2004 hurricanes. Therefore, accurate estimates of the total number of Appalachian elktoes that will be impacted (both above and below the surface of the stream bottom) are not possible, but the numbers are likely different from those recorded during the surveys.

Critical Habitat - Given that the Appalachian elktoe occurs within the area of the two bridges and Nolichucky River subbasin, it appears that the constituent elements necessary for critical habitat are present within the project area as well as portions of the Cane River, Toe River, and North Toe River. Following is a brief description of the status of the constituent elements within the project area:

1. Permanent, flowing, cool, clean water - There is variation in stream flow within critical habitat; however, there is always permanent flowing water. Based on the DWQ's bioassessments of benthic macroinvertebrate and fish sampling, the water appears to be cool and clean enough to sustain a population of the Appalachian elktoe.
2. Geomorphically stable stream channels and banks - Overall, the stream channel and stream banks appear to be stable at the two bridge sites, as evidenced by the

presence of vegetation on the river banks (trees, shrubs, and herbaceous plants) and an abundance of benthic organisms in the substrate.

3. Pool, riffle, and run sequences within the channel - The Cane River, Toe River, and North Toe River have natural pool, riffle, and run sequences, varied by the local stream gradient and bedrock influence. There is a natural pool, riffle, and run sequence at both bridge sites.
4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment - The habitat within the project area at the bridge sites consists primarily of bedrock, with small patches of gravel and coarse sand providing microhabitat for the Appalachian elktoe. At B-2848 there is more favorable habitat downstream of the bridge, consisting of an island of gravel and coarse sand and numerous Appalachian elktoes.
5. Moderate to high stream gradient - The Cane River, Toe River, and North Toe River are characterized as high stream gradient. Some portions of these reaches in the alluvial floodplain have some moderate stream gradient, but nowhere can the stream be characterized as low gradient.
6. Periodic natural flooding - Natural peak events occur throughout the Nolichucky River subbasin.
7. Fish hosts, with adequate living, foraging, and spawning areas for them - Recent sampling by the NCWRC and TVA identified fairly diverse fish communities, including many of the potential host fishes for the Appalachian elktoe in the Cane River, Toe River, and North Toe River.

### **III. ENVIRONMENTAL BASELINE**

Under section 7(a)(2) of the Act, when considering the “effects of the action” on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all federal, state, or private actions and other activities in the action area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process. The environmental baseline for this Opinion considers all projects approved prior to the initiation of formal consultation.

#### **A. Status of the Species Within the Action Area**

Survey efforts between 2000 and 2003 indicate that suitable habitat within at least 73 miles of stream in the Nolichucky River system are presently occupied by the Appalachian elktoe; an apparent 15-mile increase from reported occupied habitat prior to 2000 (Fraley and Simmons 2004). These surveys also indicate that this population

appears to be growing in numbers as well. Sites where mussels were found during 2000 and 2003 produced higher CPUEs than the nearest sites sampled prior to 2000 (Fraley and Simmons 2004). However, the available habitat in the subbasin is a limiting factor; therefore, Appalachian elktoes are not evenly dispersed throughout the 73-mile range within the subbasin. The NCWRC's sampling efforts after the floods of 2004 indicate that, since the last survey efforts in 2000 and 2003, recovery was set back to some degree based on reduced CPUE results; however, Appalachian elktoes were found throughout most of the occupied range known in 2003.

As stated previously, the 2002 mussel surveys at the bridge sites indicate that at least 26 individual Appalachian elktoes occur within project area. The CPUE for the bridge sites was 2.75 per hour for the B-1443 site and 4.28 per hour for the B-2848 site. As part of the NCWRC's continued monitoring efforts of state-listed and federally listed mussels, in 2002 and 2003 the NCWRC surveyed six sites in the Toe River for the Appalachian elktoe. Three of the six sites had higher CPUEs than the highest CPUE at the bridge sites, and four of the sites had higher CPUEs than the lowest CPUE at the bridge sites (Fraley, NCWRC, personal communication and unpublished data, 2006). This indicates that the mussel population at the bridge sites is average to below average for the Toe River. Further, while 26 individual Appalachian elktoes at the site will be relocated (and potentially lost), there are several other sites within the Toe River that support equal or greater numbers of the elktoe. Therefore, that population should be able to recover from this loss, and the conservation measures developed by the NCDOT should minimize the loss of Appalachian elktoes.

The BA determined the direct and indirect impacts occurring within 1,312 ft (400 m) downstream and 328 ft (100 m) upstream of the existing and proposed bridge sites. Considering the placement of the bridges, the total potential amount of impact at the B-1443 site is 1,820 ft (555 m) and 1,689 ft (515 m) at the B-2848 site. Therefore approximately 0.66 mile of the Toe River could potentially be directly or indirectly impacted by construction and demolition activities from the project. Therefore, within the 73-mile range of the Appalachian elktoe in the Nolichucky River system, the bridge replacement projects could have an impact on 0.9 percent of this potential habitat.

The constituent elements necessary for critical habitat are present within the project area and could be affected by the construction and demolition of the projects. The following is a list of the constituent elements that may be impacted by the project:

1. Permanent, flowing, cool, clean water - There could be impacts to the amount of sediment that enters the river from the demolition process.
2. Geomorphically stable stream channels and banks – The stream channel could be temporarily impacted during the construction of the causeways and bridge piers.
3. Pool, riffle, and run sequences within the channel – The flow of the river could change while the temporary causeways are in place.

4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment – As stated previously, the amount of sediment could increase during the bridge demolition process.

While there could be impacts to critical habitat, most of these impacts should be temporary, and the conservation measures developed by the NCDOT should minimize all effects.

## **B. Factors Affecting the Species' Environment Within the Action Area**

Some residential development and agricultural practices have impacted the aquatic habitat in the action area, particularly the riparian habitat. Because riparian areas have been cleared of trees and other woody vegetation and rock has been placed on the river banks, high-water events have resulted in bank erosion and failure at several areas in the Nolichucky subbasin. The poor condition of the riparian habitat also likely leads to excessive runoff from adjacent agriculture fields that contain not only silt but also the fertilizers and pesticides used in those fields.

Two bridges along the Toe River--B-2081 and B-3089--have been replaced within the last 10 years. No mussels were discovered within the project area of these bridges nor was critical habitat listed at that time; therefore, the projects were constructed in a manner that avoided adverse effects to the Appalachian elktoe. During August and September of 2004, significant flooding occurred in the Nolichucky River drainage. The Natural Resources Conservation Service (NRCS) proposed the implementation of the Emergency Watershed Protection (EWP) program to restore areas impacted by the flooding. In December 2005 we issued a biological opinion to the NRCS for implementation of the EWP program. That biological opinion assessed the direct and indirect impacts to 3,325 linear ft of stream within the Nolichucky River subbasin and any additional indirect impacts to 1,312 ft (400 m) downstream of each of the 18 individual restoration project "footprints." Other federal actions proposed for the upper Nolichucky River basin include widening and improving Highway 19E for about 29 miles. This will include the widening/extension and construction of several stream crossing structures within the Nolichucky River subbasin (94 crossings total) and will require a 404 permit (from the U.S. Army Corps of Engineers) for the filling of wetlands and alteration of stream channels associated with development of the proposed "Communities of Penland" along the North Toe River. We do not have any information concerning any additional federal actions ongoing or proposed for the action area at the present time.

## **IV EFFECTS OF THE ACTION**

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. The federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the

environmental baseline to determine the future baseline, which serves as the basis for the determination in this Opinion. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives that the federal agency can take to avoid a violation of section 7(a)(2). The discussion that follows is our evaluation of the anticipated direct and indirect effects of replacing the subject two bridges. Indirect effects are those caused by the proposed action that occur later in time but are still reasonably certain to occur (50 CFR 402.02).

#### **A. Factors to be Considered**

Proximity of the Action – Based on the 2002 mussel survey conducted by the NCDOT, at least 26 individuals of the Appalachian elktoe occur in the vicinity of the existing bridges. Although measures to avoid and minimize impacts to the Toe River and the Appalachian elktoe are included in the project plans, implementation of these projects will result in unavoidable impacts to the river habitat and to individual mussels. However, several other sites within the 73 miles of occupied river reaches support equal or greater numbers of individuals (Fraley, NCWRC, personal communication and unpublished data, 2006).

Nature of the Effect – In-stream habitat will be impacted permanently by the construction of the piers within the river channel, 57 ft<sup>2</sup> for B-1443 and 32 ft<sup>2</sup> for B-2848. Suitable in-stream habitat at both construction sites will also be affected for the duration of the construction and demolition and likely for some period after completion of the projects. Portions of the habitat may be impacted permanently by the construction and use of the causeways. A small portion of the riparian area at both sites may be cleared for equipment access and could result in temporary increases in water temperature at each location until reforestation can occur.

Disturbance Duration, Frequency, and Intensity – Disturbance to the riverbed will occur over a relatively short period of time from the construction of the bridge piers. It will take approximately 3 weeks to install each bent. However, the disturbance to the river's flow pattern at the piers will exist throughout the life of the bridges. The causeways for construction and demolition will be in place for the length of time needed to construct and demolish the bridges; therefore, the disturbance to the riverbed associated with the causeways will be over an extended period of time. Although there will be direct impacts to the riverbed associated with the causeways, the construction of the causeways will be phased to limit the amount of causeway in the river at any one time, and only the causeways needed for an activity will be in place during that activity and will be removed when the action is completed. The causeways will be constructed with clean stone and pipes so that the river can flow through, not just over, the causeways. However, there will still be impacts to the hydrology of the river both upstream and downstream of the causeways.

## B. Analyses of Effects of the Action

### Potential Beneficial Effects

The construction and demolition of the existing bridges have some negative impacts but also have some long-term beneficial effects. Specifically, the NCDOT has described the following beneficial effects that could result from these projects:

1. *Reduction of direct storm-water runoff.* Storm water from the existing bridges enters the river directly from the bridge decks. The new bridges will collect and direct storm water into catch basins, and the storm water will then flow through a vegetated buffer before entering the river. Storm water coming off the approaching roadways at the bridge locations will be managed in a similar manner. The elimination/reduction of runoff into the Toe River may result in localized improvement of water quality and potentially have a beneficial effect on the Appalachian elktoe.
2. *Reduction in number of bents in the main river channel.* The existing B-1443 bridge has two piers within the river channel totaling an area of 151.2 ft<sup>2</sup>. The new bridge construction will require the placement of two piers in the river, which will result in 57 ft<sup>2</sup> of fill. The existing B-2848 bridge has three piers within the river channel totaling an area of 349 ft<sup>2</sup>. The new bridge construction will require one bent for construction, consisting of two drilled piers totaling 32.0 ft<sup>2</sup> of fill. Given that bents in the river trap debris during high flows and can change the hydraulics in the immediate vicinity of the structure (causing scour and deposition), the reduction in the number of piers in the Toe River is expected to reduce the bridges' effects on stream-flow patterns at the respective bridge sites.

Direct Effects - Actions that may result in direct impacts include the construction of causeways for the construction of new structures and the demolition of existing structures, land clearing for access, potential toxic spills, the removal of causeways after construction, and the demolition and removal of existing bridge structures. All of these activities have the potential to kill or injure mussels, either by crushing them; poisoning them with the release of some toxic substance; or causing siltation, which may suffocate them. These actions may result in direct harm to individuals or negative changes in currently suitable habitat.

### Substrate Disturbance and/or Habitat Loss

Project B-1443: The construction of this new bridge will require the placement of two piers in the river, which will result in 57 ft<sup>2</sup> of permanent fill. This will be a 94.2-ft<sup>2</sup> reduction from the existing structure, which has two bents totaling 151.2 ft<sup>2</sup> of fill in the river. Rock causeways will be required to construct the new bridge and demolish the existing bridge. The temporary construction/demolition causeways used for the project are designed to result in the least amount of rock fill in the river while providing sufficient area to accomplish the construction and demolition. The causeways will be

constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 50 percent of the river will be open. To construct the piers for the new bridge and demolish the existing bridge, the causeways will result in 4,972 ft<sup>2</sup> and 3,993.4 ft<sup>2</sup> of temporary rock fill in the river, respectively. There also will be a minimal amount of temporary rock fill associated with the temporary support frames that will be placed in the river under each arch to support the bridge during demolition.

Project B-2848: The construction of this new bridge will require the placement of one bent in the river, consisting of two drilled piers, which will result in 32.0 ft<sup>2</sup> of permanent fill. This will be a 317-ft<sup>2</sup> reduction from the existing structure, which has three piers totaling 349 ft<sup>2</sup> of fill in the river. Rock causeways will also be required for construction and demolition of this project. The causeways for this project follow the design standards listed for B-1443. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 52 percent of the river will be open. To construct the piers for the new bridge and demolish the existing bridge, the causeways will result in 15,551 ft<sup>2</sup> and 1,786 ft<sup>2</sup> of temporary rock fill in the river, respectively. There also will be a minimal amount of temporary rock fill associated with the temporary support frames that will be placed in the river under each arch to support the bridge during demolition.

There will be a combined permanent loss of 89.0 ft<sup>2</sup> of stream habitat at the two project sites. There will also be a combined temporary loss of stream habitat from the construction/demolition causeways of 26,302 ft<sup>2</sup>. Based on the surveys conducted in 2002 by the NCDOT, it is likely that at least 26 individual Appalachian elktoe mussels will be impacted by the project. The NCDOT is proposing to remove individuals from the impact sites and relocate them (see the “Additional Conservation Measures” in the “Conservation Measures” section of this Opinion). While the causeways will be placed in the river only temporarily, it is difficult to predict if the impacts to the streambed will permanently or temporarily impact habitat and mussel recruitment to the sites. Given that the habitat at the impact sites consists primarily of bedrock, a reduction in suitable habitat by substrate compaction from the causeways is less likely.

#### Impacts from Sedimentation

Because of the topography and the erodible nature of the soils in the project area (fine loamy soils with moderate erodibility), project construction has the potential to result in sedimentation in the Toe River. To minimize the potential for sedimentation, the NCDOT has developed specific erosion-control measures for this project that are designed to protect environmentally sensitive areas (see the “Conservation Measures” section of this Opinion). The primary concerns for sedimentation entering the river are during the removal of the earth-filled material in bridge B-2848 and the demolition of both bridges. The NCDOT has provided a plan for the removal of the earth-filled material as well as plans for stabilizing the bridges during demolition, reducing the likelihood that sediment will enter the river as a result of these actions.



### Impacts from Changes in Hydrology

The temporary causeways proposed at both project sites will narrow the channel and will alter the hydrology, resulting in localized changes in flow patterns at the respective sites. This change in hydrology and any associated scour could result in the loss or displacement of mussels. However, the change in hydrology will be temporary, during the life of the respective causeways, and the design of the causeways (allowing for flow through the causeways) should minimize the impacts to hydrology and associated impacts. The NCDOT has proposed to monitor the riverbed and stream-bank stability before, during, and after construction at both bridge sites. If any problems with regard to stream stability are detected during the monitoring, the NCDOT has proposed to attempt to correct the problems.

### Impacts to Fish Hosts

In addition to the potential changes in hydrology as a result of the causeways, there is the potential for the causeways to act as a barrier to fish migration. The disruption of fish migrations could indirectly impact the Appalachian elktoe if the fish that are disturbed serve as fish hosts for the elktoe. While temporary disruptions to fish migration may occur during construction of the causeways, the following design factors should reduce the long-term effects of the causeways on fish migration: the causeways will be temporary structures in the river, at least 50 percent of the channel will be unrestricted by the causeways at any given time, and the causeways are designed to allow for linear flow. Given these design features, the causeways are not expected to have a significant impact, if any, on the natural migration of fish species and therefore should not impact the life cycle or distribution of the Appalachian elktoe in the Toe River.

Indirect Effects - Indirect effects are defined as those that are caused by the proposed action and are later in time but are still reasonably certain to occur (50 CFR 402.02). Indirect effects to the Appalachian elktoe may include permanent changes in channel substrate or stability that adversely affect the availability of suitable habitat in the vicinity of the bridges.

The infrastructure improvements associated with these bridge replacements could indirectly affect and improve levels of service, better accommodate merging and exiting traffic, or reduce travel times, all of which could have land-development impacts outside the project area. Given that both projects involve the replacement of existing structures in essentially the same locations, it is not likely that the new structures would increase accessibility to the adjacent land or result in changes in the type or volume of traffic using the structures. Although the existing bridges will be replaced with wider two-lane structures, potentially allowing access to the surrounding land by larger trucks (including construction equipment), there are other existing bridges and road access surrounding the existing bridges that allow for the passage of large vehicles and provide access to the same land area as the subject bridges.

Interrelated and Interdependent Actions - An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. A determination of whether other activities are interrelated to, or interdependent with, the proposed action under consultation is made by applying the “but for” test. That is, it must be determined that the other activity under question would not occur “but for” the proposed action under consultation. There are no other projects planned that would satisfy the “but for” test; therefore, there are no interrelated or interdependent actions that should be considered in this Opinion.

## **V. CUMULATIVE EFFECTS**

### Action Area

Cumulative effects include the combined effects of any future state, local, or private actions that are reasonably certain to occur within the action area covered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

We are aware of several potential private actions that may occur and produce significant cumulative impacts. A proposed 40-unit affordable housing development is proposed on the north side of US 19E in Burnsville, near Mountain Heritage High School and near the headwaters of the Toe River. In Mitchell County, just north of Spruce Pine, approximately 2,000 to 5,000 acres within the North Toe River drainage area (owned by Penland Bailey Corporation) is being divided into 0.5- to 2-acre lots, with some of the lots bordering the North Toe River. A golf course development (planned to be patterned after the Mountain Air Country Club in Yancey County) is proposed near Altapass in Mitchell County, within the North Toe River watershed. A 100-acre development is being planned near Hunt Dale, in Yancey and Mitchell Counties, with over 13,000 linear ft of the Cane River and over 2,000 linear ft of the Toe River occurring within the property boundary. Although these actions are being proposed, it is uncertain if they will be developed or if they will need a federal permit or money to construct the projects. Therefore, we will not address these developments further in this Opinion. We are not aware of any other future state, local, or private actions that are reasonably certain to occur within the action area that would not be subject to section 7 reviews. Therefore, cumulative effects, as defined by the Act, will not occur and will not be addressed further in this Opinion.

### Cumulative Impacts of Incidental Take Anticipated by the Service in Previously Issued Biological Opinions

In reaching a decision of whether the implementation of activities outlined in the BA are likely or are not likely to jeopardize the continued existence of the Appalachian elktoe, we must factor into our analysis previous biological opinions issued involving the species, especially those opinions where the Service allowed for incidental take as the area of

habitat disturbed, instead of individual mussels. There have been four biological opinions for the Appalachian elktoe, one within the Nolichucky River drainage and the others outside the drainage. In May of 2005 we issued a biological opinion to the U.S. Army Corps of Engineers on the effect of their permit on the Appalachian elktoe for a sewer line crossing along the Mills River. The amount of incidental take was limited to the disturbance of habitat 20 ft in width at the construction corridor and 100 ft downstream and upstream of the construction corridor. The three other biological opinions were rendered to the NRCS in 2005 for the implementation of the EWP program in the Nolichucky, Pigeon, and Mills River subbasins. These biological opinions limited the amount of incidental take to all Appalachian elktoes within at least 3,325 linear ft of stream within the Nolichucky, Pigeon, and Mills River subbasins and any additional indirect impacts to Appalachian elktoes 1,312 ft (400 m) downstream of each of the 40 individual restoration project "footprints."

## **VI. CONCLUSION**

After reviewing the current status of the Appalachian elktoe; the environmental baseline for the action area; the effects of bridge construction and demolition; measures identified in the NCDOT's BA to help minimize the potential impacts of the proposed projects and assist in the protection, management, and recovery of the species; previously issued Service nonjeopardy biological opinions that allow various levels of incidental take; any potential interrelated and interdependent actions associated with the proposed action; and any potential cumulative effects, it is the Service's biological opinion that implementing these projects is not likely to jeopardize the continued existence of the Appalachian elktoe. Critical habitat will not be adversely modified or destroyed by implementing these projects as proposed.

## **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and federal regulations pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

## **Amount of Take Anticipated**

The Service anticipates that incidental take of the Appalachian elktoe may occur as a result of construction of the subject bridges. During construction, individual mussels may be crushed, harmed by siltation or other water quality degradation, or dislocated because of physical changes in their habitat.

There will be a combined permanent loss of 89.0 ft<sup>2</sup> of stream habitat at the two project sites. There will also be a combined temporary loss of stream habitat from the construction/demolition causeways of 26,302 ft<sup>2</sup>. Downstream impacts (sedimentation), if any, are expected to occur within 1,312 ft (400 m) of the construction sites. Because there are no reliable data on the number of Appalachian elktoes buried in the substrate compared to those on the surface (and even those on the surface are difficult to detect), it is not possible to base the amount of incidental take on numbers of individual mussels. Rather, the amount of incidental take will be exceeded if the project “footprint” exceeds 26,391 ft<sup>2</sup> or downstream impacts are occurring more than 1,312 ft (400 m) downstream from the “footprint” of each project. If incidental take is exceeded, all work should stop, and the Service should be contacted immediately.

## **EFFECT OF THE TAKE**

In this Opinion the Service has determined that this level of take is not likely to result in jeopardy to the Appalachian elktoe or destruction or adverse modification of critical habitat.

In addition to the subsequent measures listed in the “Reasonable and Prudent Measures” and “Terms and Conditions” sections of this Opinion, the measures listed in the “Conservation Measures” section<sup>5</sup> of this opinion must be implemented. The Conservation Measures are project minimization measures, for the construction and demolition of the projects, that were described by the NCDOT in the BA. The Conservation Measures include, but are not limited to, the following:

1. The NCDOT will provide, or contract with biologists who have experience in mussel relocation techniques, for the removal of Appalachian elktoes from the impact site and relocate them to the approved relocation site on the North Toe River (between Penland and Boonford) at about river mile 25.5, according to the procedures in the approved relocation plan in the BA (see plan within the BA). The plan details appropriate collection methods, tagging and recapture, handling and transportation of individuals, and monitoring protocols, which includes the monitoring of the relocation sites for recovery, survival (of recovered mussels), movement, and growth of mussels for a period of 5 years.

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<sup>5</sup>The “Conservation Measures” section includes all of the measures listed within the following subsections: “Conservation Measures for Bridge Design,” “Conservation Measures for Bridge Demolition,” “Conservation Measures for Bridge Construction,” and “Additional Conservation Measures.”

2. The NCDOT will monitor the river channel and banks at sites upstream, at the construction sites, and downstream to determine changes in habitat resulting from activities at these sites (see plan within the BA). If any problems with regard to stream stability are detected during the monitoring, the NCDOT will attempt to correct them.
3. As committed to by the NCDOT within the project description of the BA, the NCDOT will protect and/or restore 100-ft riparian buffers for at least 3,000 linear ft of stream within the action area. Given that the conservation area has not been determined or obtained by the NCDOT at the time of the issuance of this Opinion, the Service will continue to review sites that the NCDOT is considering and approve the site that is ultimately acquired.

### **Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the Appalachian elktoe. These nondiscretionary measures include, but are not limited to, the terms and conditions outlined in this Opinion.

1. The NCDOT will ensure that the contractor understands and follows the measures listed in the “Conservation Measures,” “Reasonable and Prudent Measures,” and “Terms and Conditions” sections of this Opinion.
2. Containment systems will be developed for particular stages of the demolition and construction of the bridges to minimize impacts to the Appalachian elktoe and its habitat.
3. Demolition activities and the relocation of mussels will be conducted during time periods that will result in fewer impacts to the Appalachian elktoe.
4. The NCDOT will send copies of the monitoring reports for the relocated mussels to the Service’s Asheville Field Office every year for the 5-year monitoring time period.
5. During the relocation of mussels, the Service may alter, if needed, methods and plans for moving the mussels.
6. The NCDOT will notify the Service if their monitoring of the river channel and river banks reveals changes in habitat resulting from project activities.
7. All appropriate NCDOT BMP for bridge maintenance, construction, and demolition will be followed or exceeded for these projects, and any additional BMP listed in the “Terms and Conditions” section of this Opinion will be followed.

## Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the NCDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described previously and outline required reporting and/or monitoring requirements. These terms and conditions are nondiscretionary and apply to the Toe River.

1. A Service biologist will be present at the preconstruction meeting to cover permit conditions and discuss any questions the contractor has regarding implementation of these projects. After the contractor submits plans for various stages of the projects, a Service biologist will review and provide comments on the plans and will attend any meetings to discuss implementation of the plans.
2. The NCDOT will ensure that a qualified aquatic biologist is present at critical times to monitor certain phases of construction, including, but not limited to, initial clearing for construction, when the causeways are installed, when demolition begins, and when the causeways are removed. The individual will be present to ensure that the procedures listed in the "Conservation Measures," "Reasonable and Prudent Measures," and "Terms and Conditions" sections of this Opinion are being implemented and that all project plans are being implemented in a manner to ensure that the conditions of the Opinion are met.
3. If during demolition the bridge decks start to crumble and enter the river, a containment system shall be developed and installed to catch debris that inadvertently falls from the concrete deck of bridge B-2848 and the concrete rail and deck of bridge B-1443.
4. A containment system shall be developed and installed prior to the removal of the piers. The conservation measures proposed by the NCDOT recommend placing turbidity curtains, if the water depth is sufficient, around each of the bents. We are concerned that turbidity curtains will not be of sufficient strength to capture material that may enter the river; therefore, we recommend that the design include a containment system such as the Jersey barriers (with fabric) around each bent.
5. When constructing the drilled shafts a containment system will be developed so that material does not enter the river. Any material by-product will be pumped out of the shaft and onto uplands and to an off-site disposal area or will be treated through a proper stilling basin or silt bag.
6. The conservation measures proposed by the NCDOT state that the saw slurry used during the demolition process will be contained by approved vacuum methods. Given that a wet saw will be used, the vacuum methods should include a provision for pumping and treating the saw slurry outside the project area.
7. The NCDOT will not relocate mussels between May 1 and June 30, the time at which Appalachian elktoes release glochidia. The NCDOT will relocate the mussels during

low flow, low turbidity, and relatively cool weather; the most appropriate time to accomplish this would be in the fall.

8. Demolition of the bridge substructure will occur during low flow in order to reduce the likelihood that sediment will leave the project area and potentially impact downstream resources.
9. In the BA, the NCDOT proposed to relocate all native mussels, including the Appalachian elktoe, from the project “footprints,” extending downstream 262 ft (80 m) and upstream 66 ft (20 m) of the two bridge replacements. Representatives of the Service’s Asheville Field Office may determine during relocation of the mussels that the area the mussels are moved from should be reduced.
10. A Service biologist will review and provide comments on plans proposed to correct problems that may be revealed in the monitoring of the river channel and banks within the project area.
11. The erosion-control plan will be in place prior to any ground disturbance. When needed, combinations of erosion-control measures (such as silt bags in combination with a stilling basin) will be used to ensure that the most protective measures are being implemented.
12. Activities in the floodplain will be limited to those needed to construct the proposed bridges and remove the existing bridges.
13. Work pads will be used when equipment must be staged in the floodplain to complete the project construction. The work pads will be constructed by placing fabric matting down prior to placing the stone work pad. All of the stone and matting will be removed and disposed of off-site or the stone can be used in areas that require permanent stone protection after project completion.
14. Access roads and construction staging areas will be minimized to the maximum extent practicable. The access roads and construction staging areas should be established from the start of the project and designed with erosion-control measures. The placement of the access roads and staging areas will be discussed with the Service and determined at the preconstruction meetings.
15. Riparian vegetation, especially large trees, will be maintained wherever possible. If riparian areas are disturbed, they will be revegetated with native species as soon as possible after construction.
16. Upon completion of the project the existing approach fills will be removed to natural grade, and the area will be planted with native grasses and tree species.
17. Construction will be accomplished in a manner that prevents wet concrete from coming into contact with water entering or flowing in the river.

18. Unconsolidated material (such as sand and dirt) will not be placed directly on the causeways since the material could be washed off of the causeways or settle into the causeways and enter the river. If unconsolidated material must be placed on the causeways, a solid barrier will be placed on the causeways prior to the placement of the material. The barrier and unconsolidated material will be removed anytime throughout a work day when the water level rises to a point, or is expected to rise over night to a point, where material could wash off the causeway or during periods of inactivity (two or more consecutive days). Any equipment that is placed on the causeways will also be removed anytime throughout a work day when the water level rises to a point, or is expected to rise over night to a point, where the equipment could be flooded or during periods of inactivity (two or more consecutive days). The only exception to this measure is that the drill rig may be left in place for periods of inactivity; however, it must also be removed if the water rises or is expected to rise to a point where the drill rig could be flooded.
19. All construction equipment should be refueled outside the 100-year floodplain or at least 200 ft from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 ft from all water bodies (whichever distance is greater), preferably at an upland site. Areas used for borrow or construction by-products will not be located in wetlands or the 100-year floodplain.

## **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Where opportunities exist, work with landowners, the general public, and other agencies to promote education and information about the Appalachian elktoe and its conservation.
2. Pursue additional buffers and conservation opportunities along the main stem of the Cane River, North Toe River, and Toe Rivers and their tributaries, either individually or in concert with other conservation programs.
3. Explore opportunities to work with local and state water quality officials in order to minimize or eliminate wastewater and storm-water discharges into the Cane River, North Toe River, and Toe River.



4. Consult with the Service on projects affecting aquatic habitat in the Toe River drainage, regardless of funding source, to ensure compliance with all provisions of the Act.

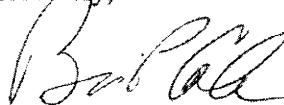
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

#### REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the actions outlined in your BAs dated May 12, 2005, and February 21, 2006. As provided in 50 CFR 402.16, the reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease, pending reinitiation. Consultation should also be reinitiated if new biological information comes to light that invalidates the assumptions made regarding the biology or distribution of the Appalachian elktoe within the project area of the Nolichucky River subbasin in North Carolina.

If there are any questions, please contact Ms. Denise Moldenhauer of our staff at 828/258-3939, Ext. 226, or me, Ext. 223. We have assigned our log number 4-2-02-460 to this consultation; please refer to this number in any future correspondence concerning this matter.

Sincerely,



Brian P. Cole  
Field Supervisor

cc:

Mr. Tom Walker, Asheville Regulatory Field Office, U.S. Army Corps of Engineers, 151 Patton Avenue, Room 208, Asheville, NC 28801-5006

Mr. Brian Wrenn, North Carolina Division of Water Quality, Central Office, 2321 Crabtree Blvd., Suite 250, Raleigh, NC 27604

Mr. Harold Draper, NEPA Specialist, Environmental Management, Tennessee Valley Authority, 400 West Summit Hill Drive, WT8C, Knoxville, TN 37902-1499

Electronic copy to:

Mr. Logan Williams, Natural Environment Biological Surveys Group Supervisor, North Carolina  
Department of Transportation, 1598 Mail Service Center, Raleigh, NC 27699-1598

Mr. Roger Bryan, Environmental Compliance Officer, North Carolina Department of  
Transportation, P.O. Box 3279, Asheville, NC 28802

Mr. Steve Fraley, Aquatic Non-game Coordinator, Western Region, North Carolina Wildlife  
Resources Commission, 50 Trillium Way, Clyde, NC 28721

Ms. Marla J. Chambers, Western NCDOT Permit Coordinator, North Carolina Wildlife  
Resources Commission, 4614 Wilgrove-Mint Hill Road, Suite M, Charlotte, NC 28227

Regional Director, FWS, Southeast Regional Office, Atlanta, GA (ES, Attention: Mr. Joe  
Johnston)

Field Supervisor, FWS, Raleigh Field Office, Raleigh, NC (Attention: Mr. Gary Jordan)

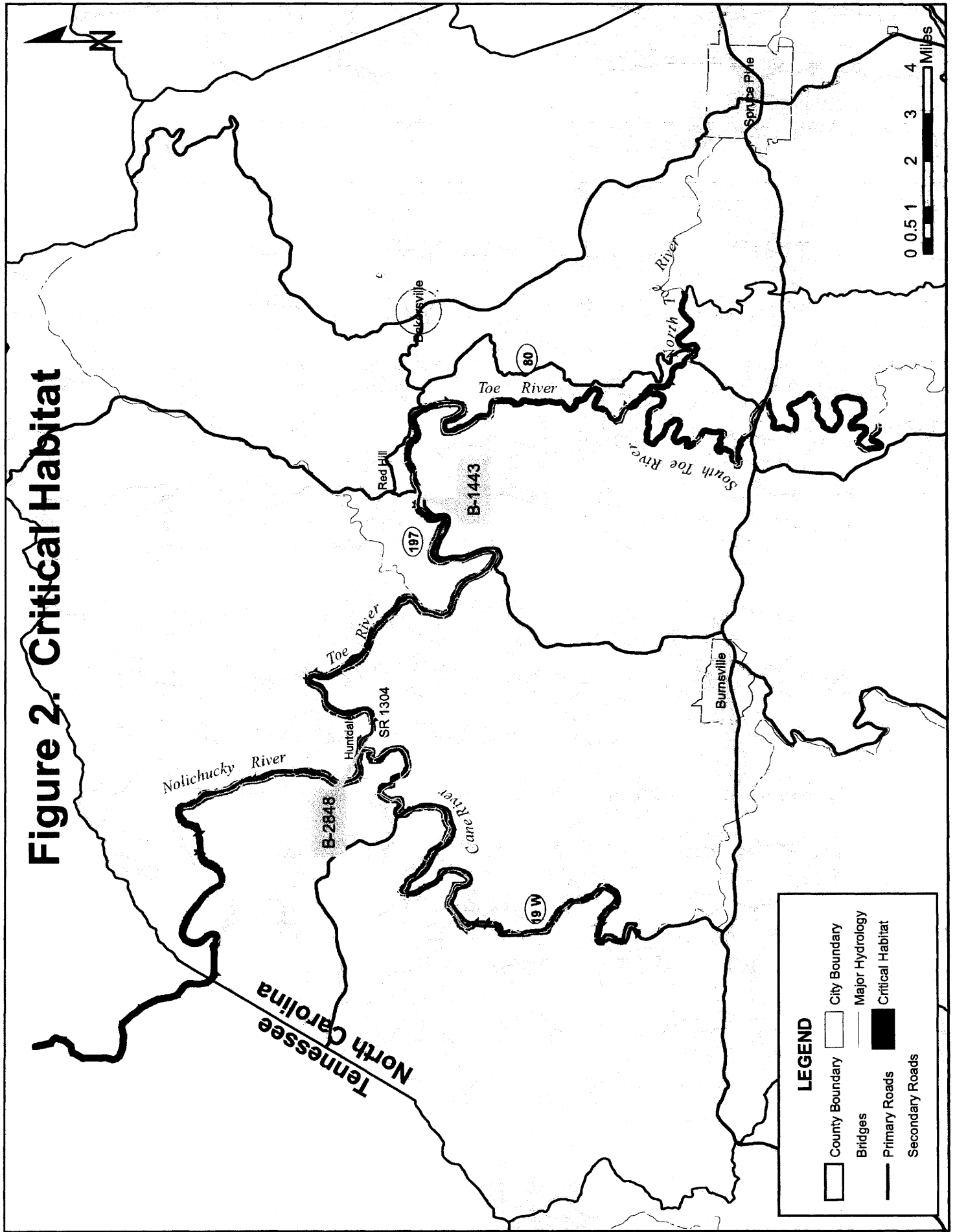
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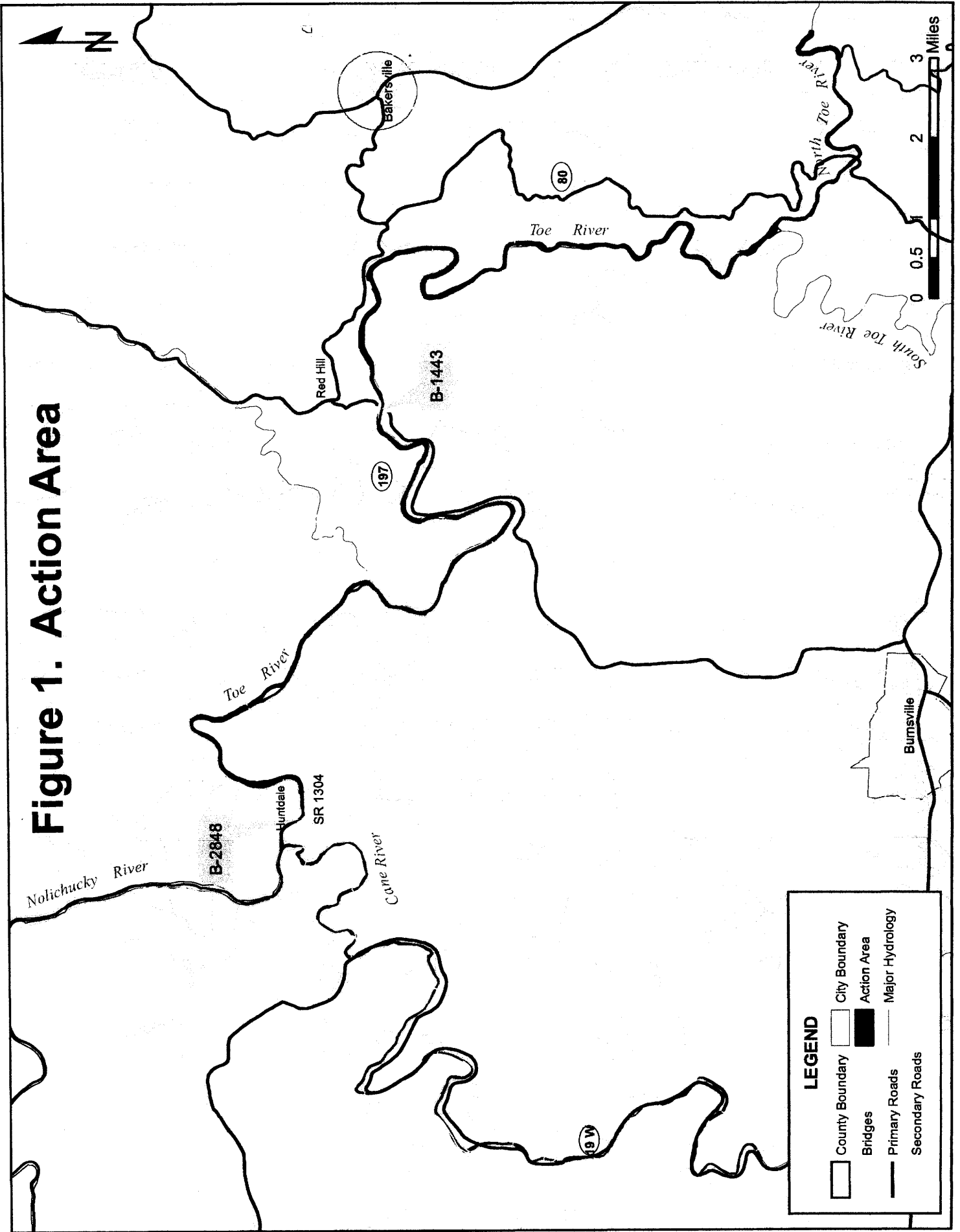
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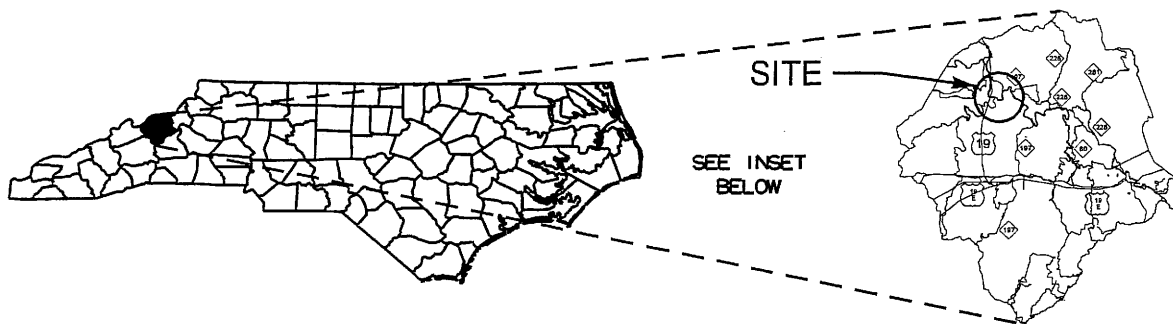
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# Figure 2. Critical Habitat

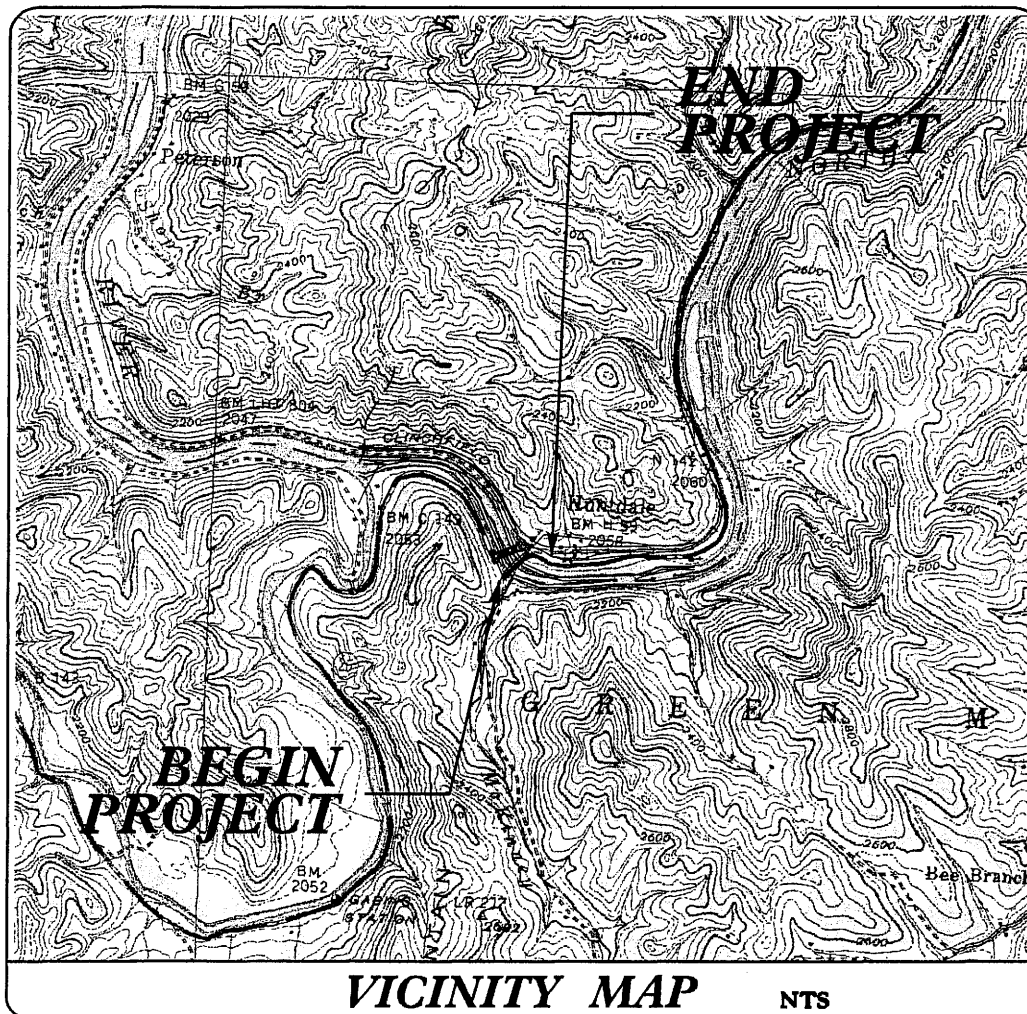


**Figure 1. Action Area**





# MITCHELL/YANCEY COUNTY



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DIVISION OF HIGHWAYS  
PDEA-OFFICE OF NATURAL ENVIRONMENT

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

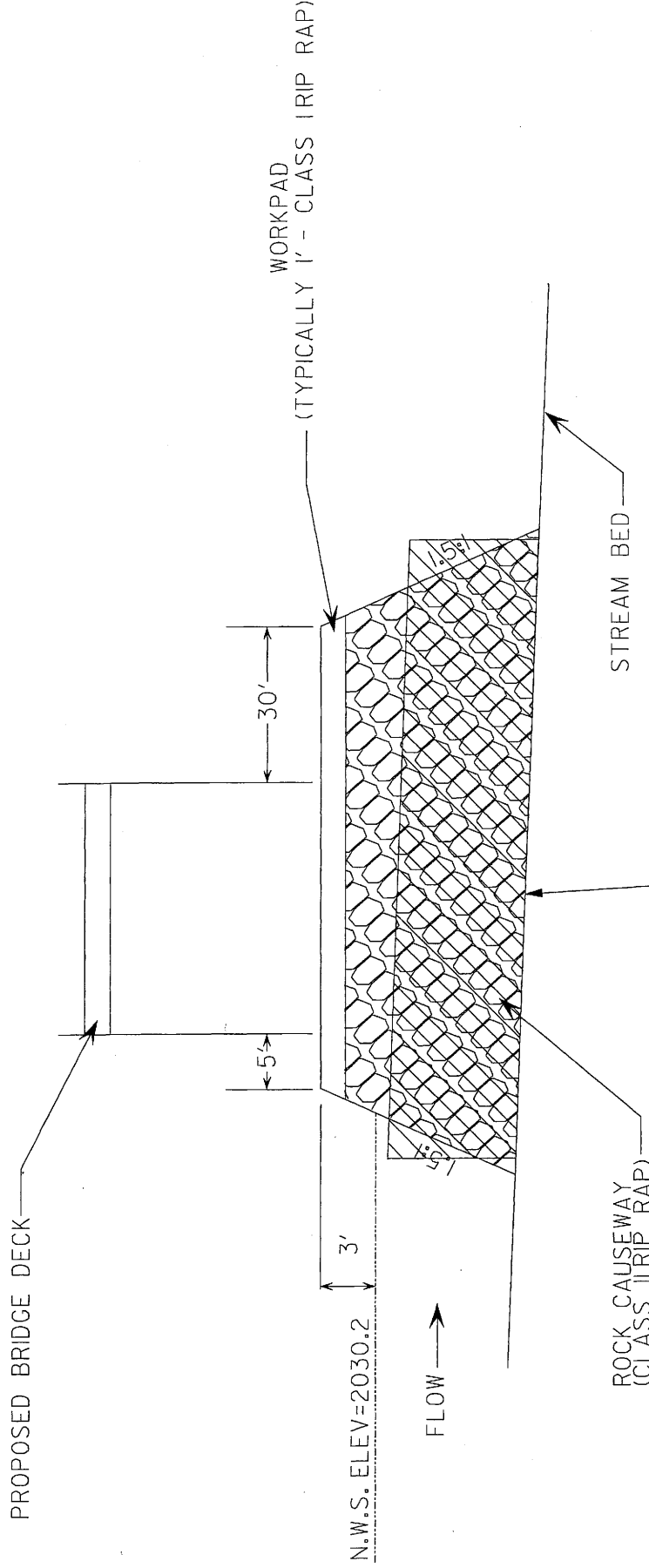
MITCHELL/YANCEY COUNTY  
PROJECT: 8.2880401 (B-2848)  
BRIDGE NO. 143 ON SR 1304  
OVER NORTH TOE RIVER

SHEET 1 OF 1

8/15/06



# WORKPAD DETAIL (NOT TO SCALE)



**NCDOT**  
DIVISION OF HIGHWAYS  
MITCHELL/YANCEY COUNTY  
PROJECT: 8.2880401 (B-2848)  
BRIDGE #143 ON SR 1304  
OVER NORTH TOE RIVER

64"X43" CSP ARCH  
(SEE PLAN FOR LOCATIONS)

## QUANTITIES OF ESTIMATES

VOLUME OF CLASS IRIP RAP= 2175 yds<sup>3</sup>  
AREA OF CLASS IRIP RAP= 0.398 ac  
Estimate 2480 Tons Class IRip Rap

## WETLAND PERMIT IMPACT SUMMARY

[illegible]

$< 0.01$  acre of permanent  
stream surface due to bridge  
beds.

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

YANCEY/MITCHELL COUNTY  
PROJECT 8.2880401 B-2848

Form Revised 3/22/01

SHEET } OF

REV 8/18/2006

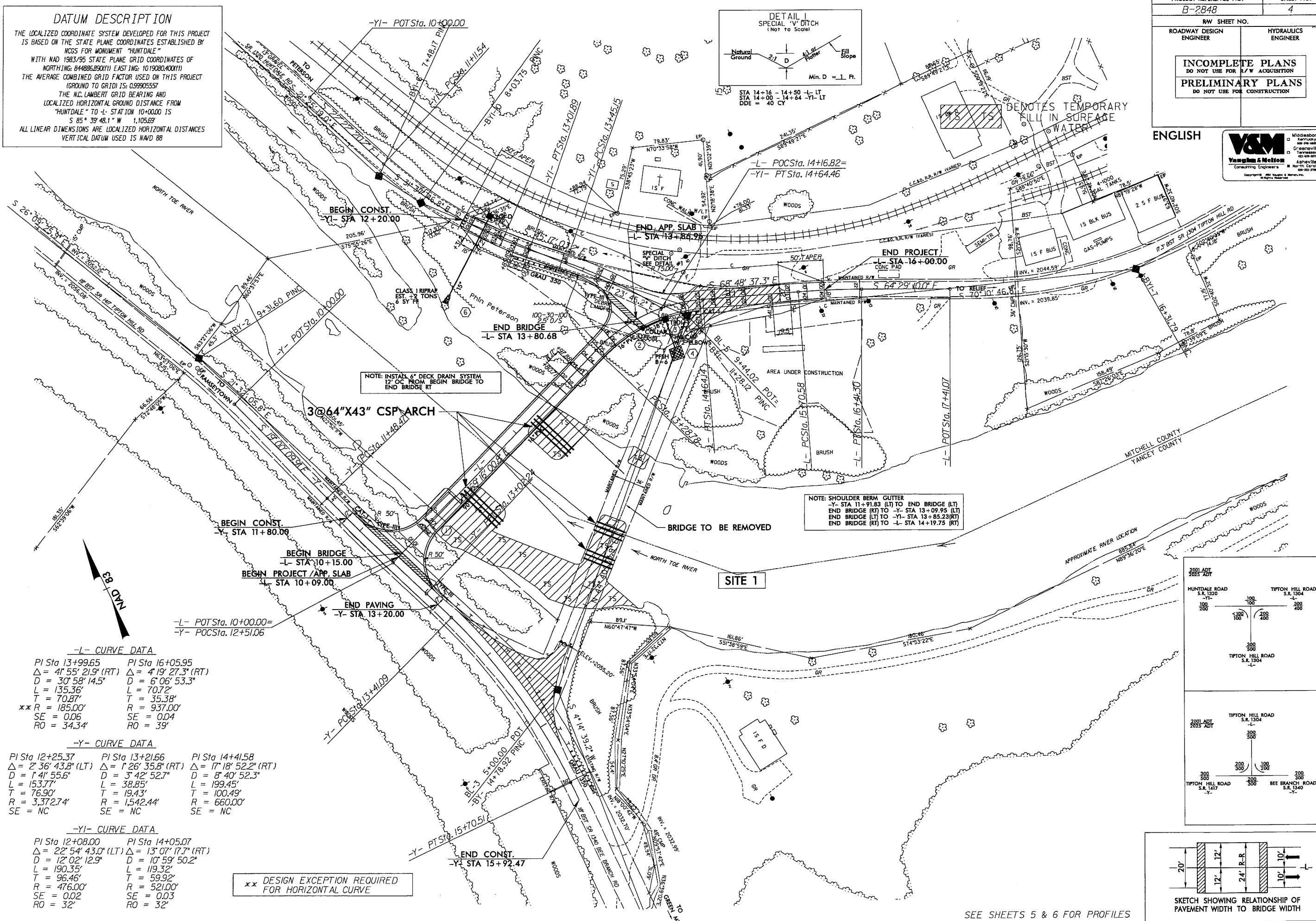
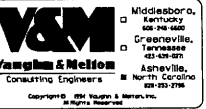
8/17/99

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCSS FOR MONUMENT "HUNTDAL".  
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF  
NORTHING: 844886.850(11) EASTING: 1019080.400(11)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99905557  
THE N.C. LAMBERT GRID BEARING AND  
LOCALIZED HORIZONTAL DISTANCE FROM  
"HUNTDAL" TO L- STATION 10+00.00 IS  
S 85° 39' 48.1" W 1.10569'  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

PROJECT REFERENCE NO. B-2848		SHEET NO. 4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

ENGLISH



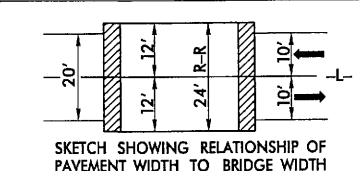
-L- CURVE DATA		
PI Sta 13+99.65	PI Sta 16+05.95	
$\Delta = 41^{\circ} 55' 21.9"$ (RT)	$\Delta = 41^{\circ} 27' 3.3"$ (RT)	
D = 30' 58" 14.5"	D = 6' 06" 53.3"	
L = 135.36'	L = 70.72'	
T = 70.87'	T = 35.38'	
** R = 185.00'	R = 937.00'	
SE = 0.06	SE = 0.04	
RO = 34.34'	RO = 39'	

-Y- CURVE DATA		
PI Sta 12+25.37	PI Sta 13+21.66	PI Sta 14+14.58
$\Delta = 2^{\circ} 36' 43.8"$ (LT)	$\Delta = 1^{\circ} 26' 35.8"$ (RT)	$\Delta = 17^{\circ} 18' 52.2"$ (RT)
D = 1' 41" 55.6"	D = 3' 42" 52.7"	D = 8' 40" 52.3"
L = 153.77'	L = 38.85'	L = 199.45'
T = 76.90'	T = 19.43'	T = 100.49'
R = 3,372.74'	R = 1,542.44'	R = 660.00'
SE = NC	SE = NC	SE = NC

-YI- CURVE DATA	
PI Sta 12+08.00	PI Sta 14+05.07
$\Delta = 22^{\circ} 54' 43.0"$ (LT)	$\Delta = 13^{\circ} 07' 17.7"$ (RT)
D = 12' 02" 12.9"	D = 10' 59" 50.2"
L = 190.35'	L = 119.32'
T = 96.46'	T = 59.92'
R = 476.00'	R = 521.00'
SE = 0.02	SE = 0.03
RO = 32'	RO = 32'

\*\* DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE

SEE SHEETS 5 & 6 FOR PROFILES



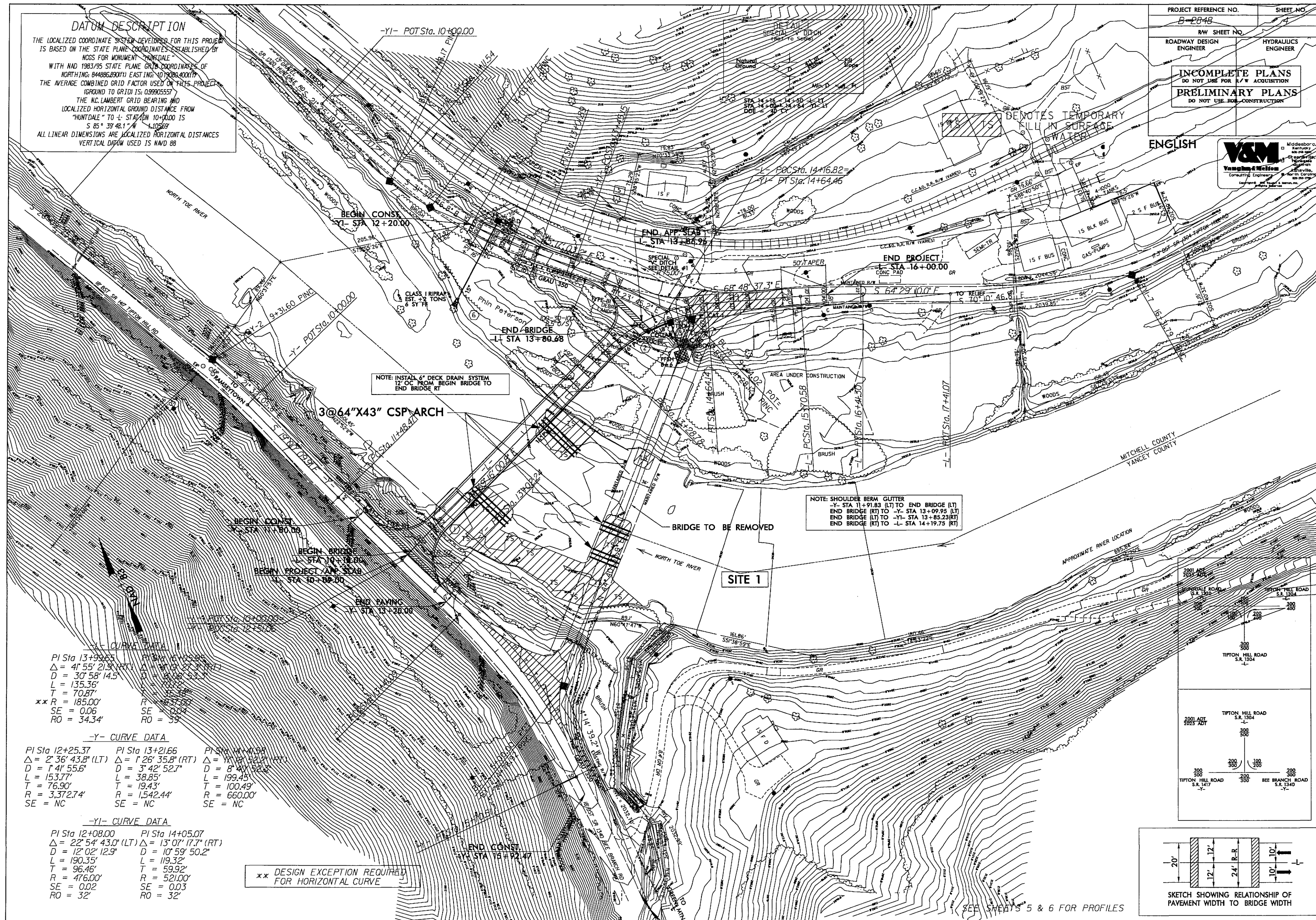
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 WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF  
 NORTHING: 844896.800111 EASTING: 107908.400111  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT  
 (GROUND TO GRID) IS: 0.99905557  
 THE N.C. LAMBERT GRID BEARING AND  
 LOCALIZED HORIZONTAL GROUND DISTANCE FROM  
 "HUNTDAL" TO L- STA 10+00.00 IS  
 S 85° 39' 48.1" W 1.10569'  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

PROJECT REFERENCE NO.	SHEET NO.
B-0048	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



ENGLISH

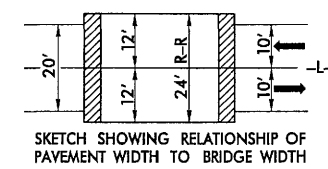
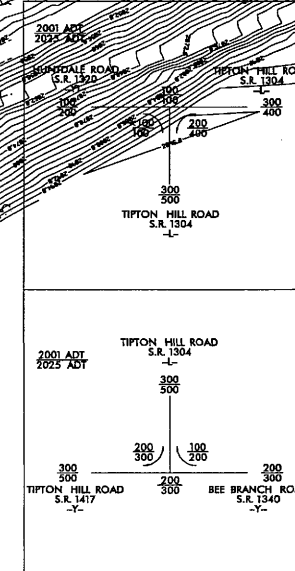


**-X- CURVE DATA**  
 PI Sta 13+93.65  
 $\Delta = 41^\circ 55' 21.9''$  (RT)  
 $D = 30^\circ 58' 14.5''$   
 $L = 135.36'$   
 $T = 70.87'$   
 $**R = 185.00'$   
 $SE = 0.06$   
 $RO = 34.34'$

**-Y- CURVE DATA**  
 PI Sta 12+25.37  
 $\Delta = 2^\circ 36' 43.8''$  (LT)  
 $D = 1^\circ 41' 55.6''$   
 $L = 153.77'$   
 $T = 76.90'$   
 $R = 3,372.74'$   
 $SE = NC$

**-Y- CURVE DATA**  
 PI Sta 13+21.66  
 $\Delta = 1^\circ 26' 35.8''$  (RT)  
 $D = 3^\circ 42' 52.7''$   
 $L = 38.85'$   
 $T = 19.43'$   
 $R = 1,542.44'$   
 $SE = NC$

\*\* DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE



SEE SHEETS 5 & 6 FOR PROFILES





8/23/99



PROJ. REFERENCE NO.  
B-2848

SHEET NO.  
X-1

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INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION

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8/23/99



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8/23/99



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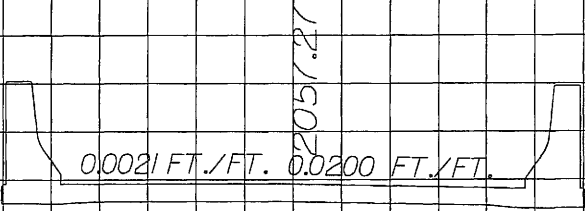
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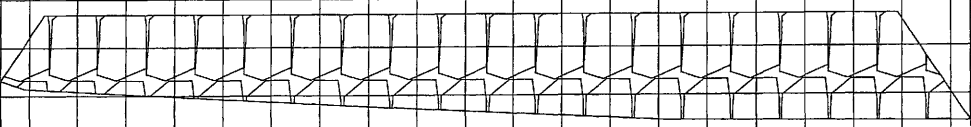
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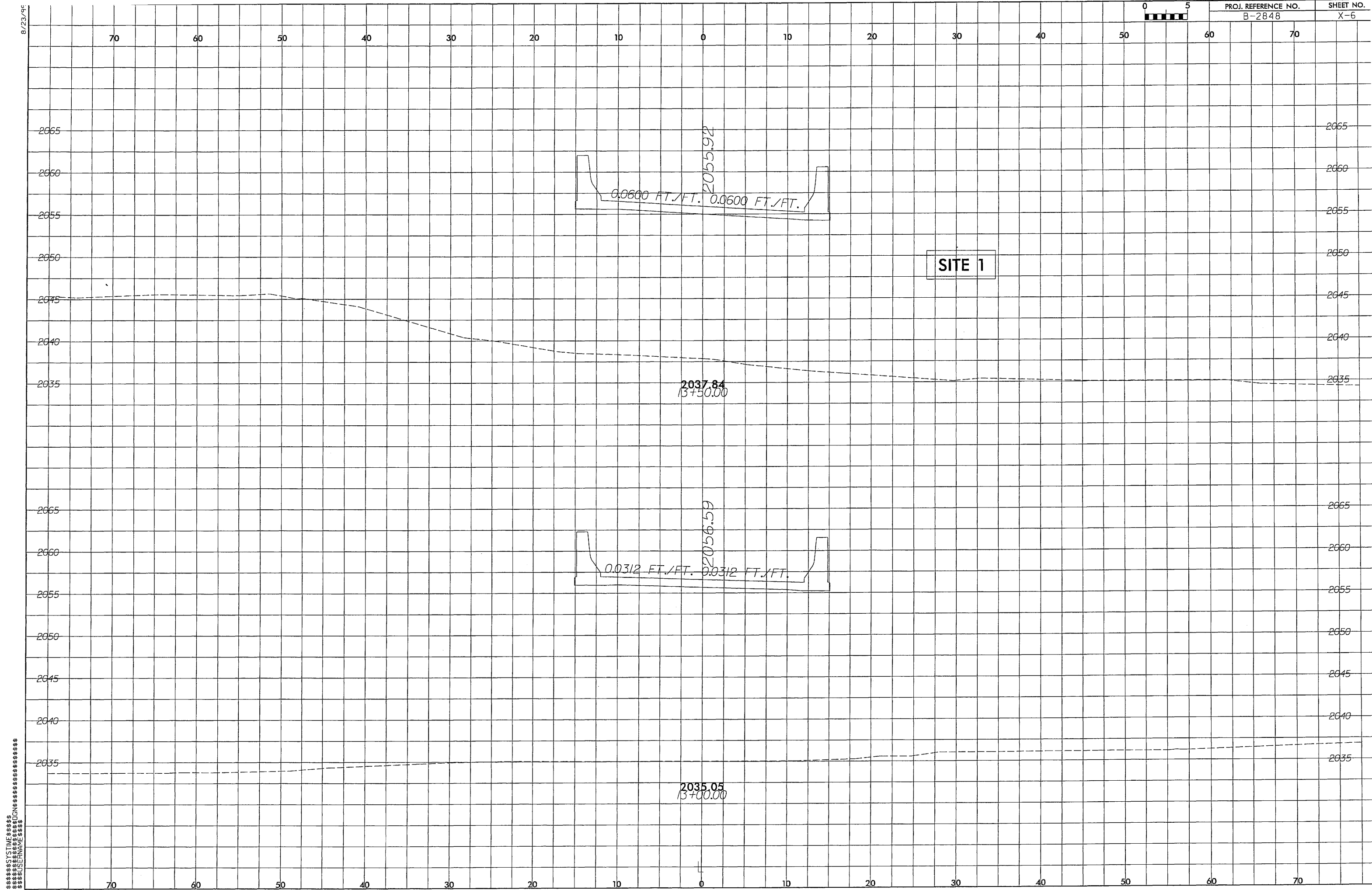
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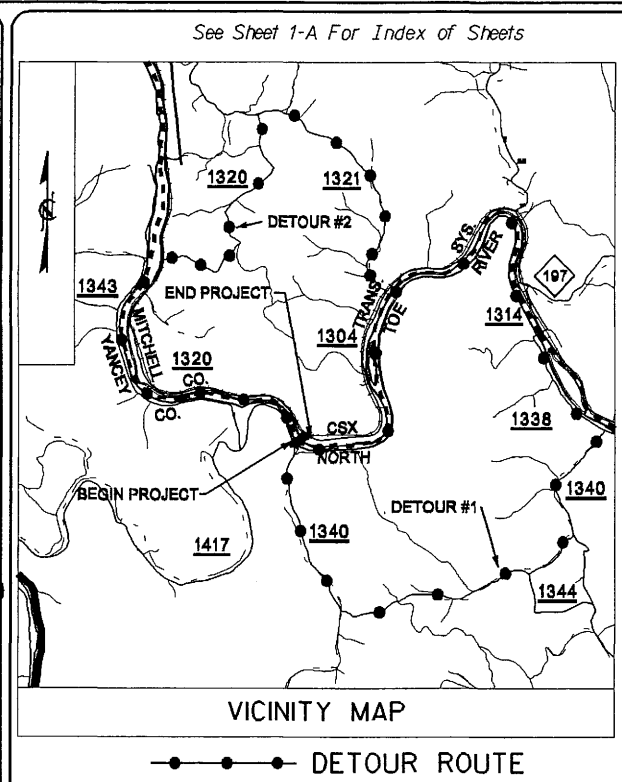
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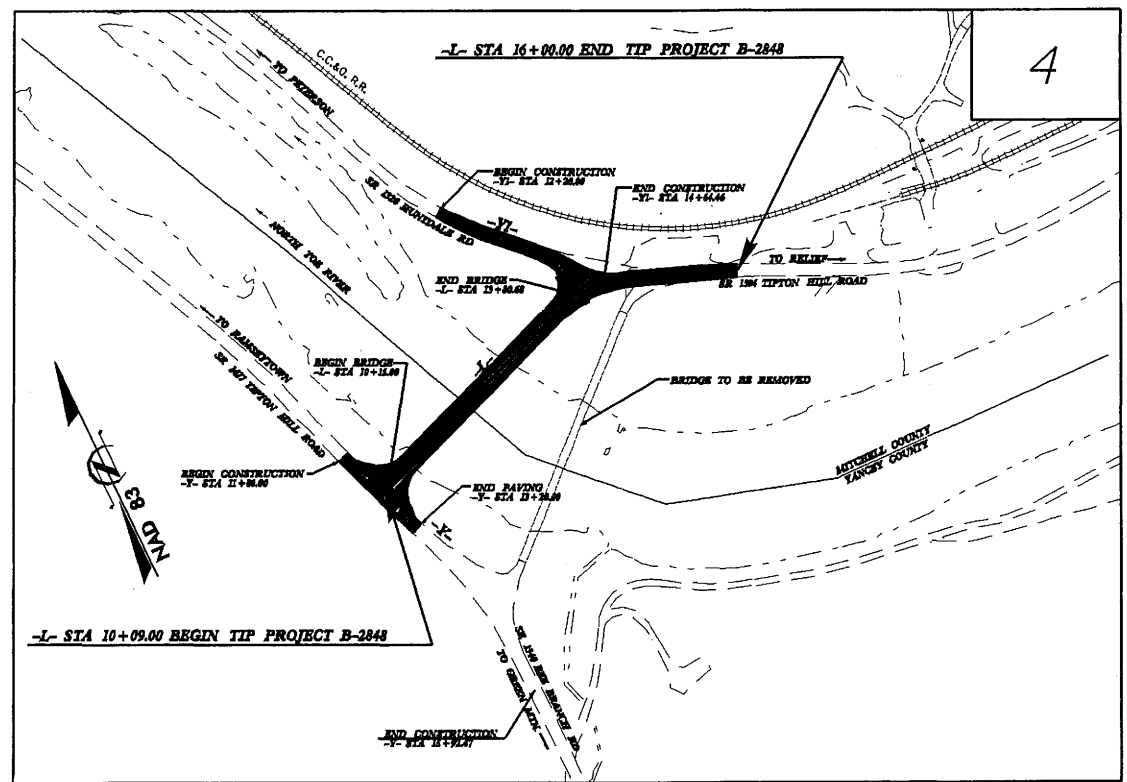
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**YANCEY & MITCHELL COUNTIES**

LOCATION: Bridge #143 on SR 1304  
over North Toe River

TYPE OF WORK: Grading, Paving, Drainage, and Structure

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-2848	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
32728.1.1	BRZ-1304(4)	PE	
32728.2.2	BRZ-1304(4)	RW & UTIL.	
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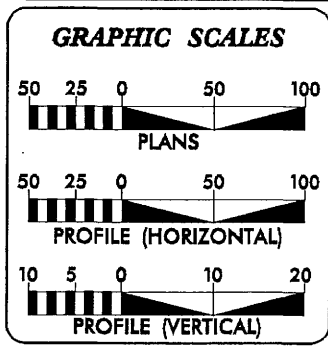


NCDOT Contact: Teresa Bruton, PE – Project Engineer – Design Services

**V&M**  
Vaughan & Melton  
Consulting Engineers

Middlesboro, Kentucky 402-298-6600  
Greenville, Tennessee 423-439-0071  
Asheville, North Carolina 828-253-7796

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**DESIGN DATA**

ADT 2001 = 300
ADT 2025 = 500
DHV = 11 %
D = 70 %
T = 5 % *
V = 35 MPH**
* TTST 2 % DUAL 3 %
** DESIGN EXCEPTION REQUIRED FOR HORIZONTAL CURVE

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT B-2848 = 0.043 MI
LENGTH STRUCTURE TIP PROJECT B-2848 = 0.069 MI
TOTAL LENGTH TIP PROJECT B-2848 = 0.112 MI

Prepared For:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., NC, 27610

2002 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: AUGUST 28, 2003	JERRY A. CARTER, PE PROJECT ENGINEER
LETTING DATE:	REECE M. SCHULER, PE PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

APPROVED  
DIVISION ADMINISTRATOR

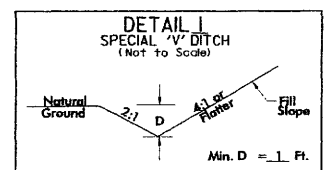
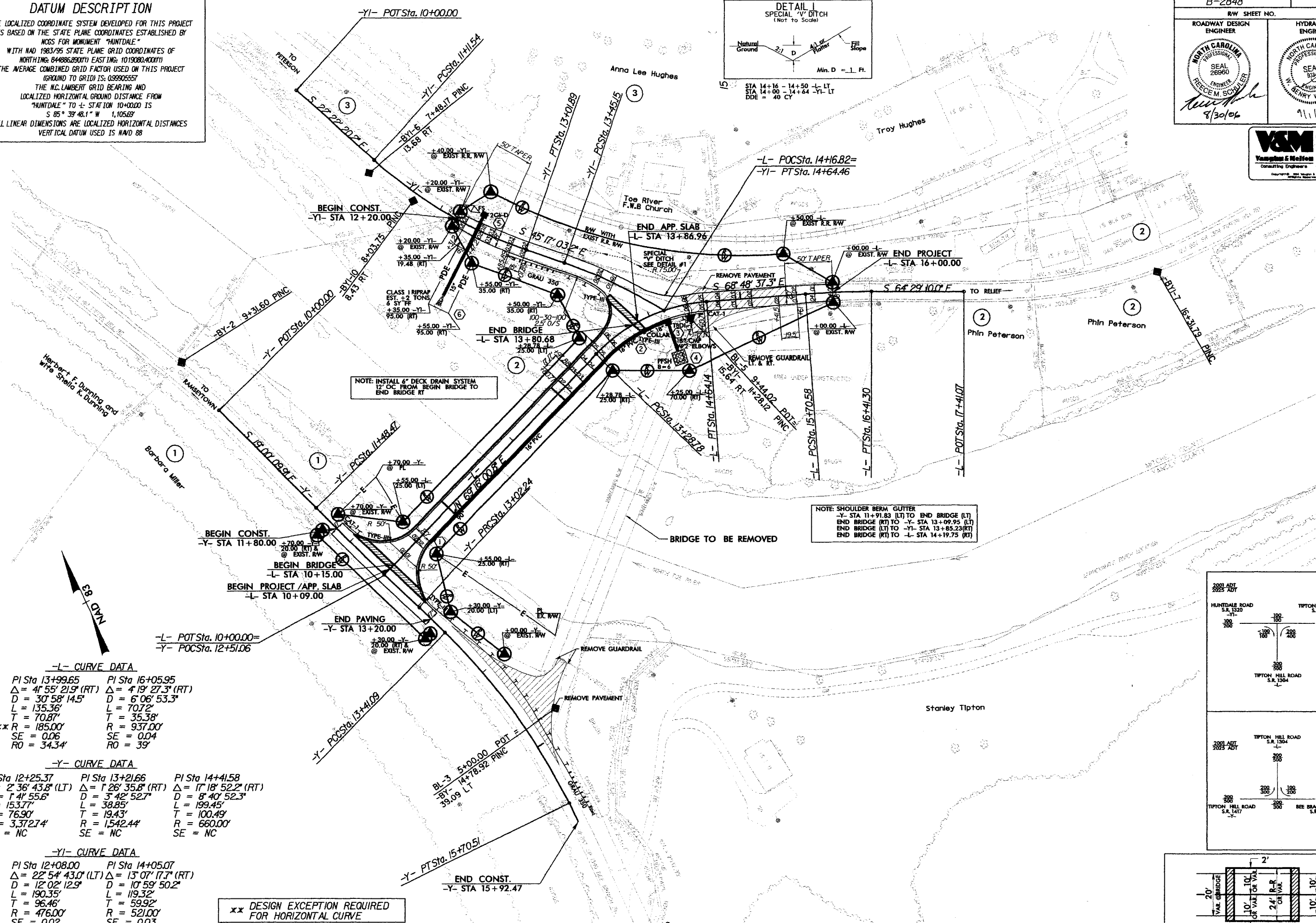
DATE

8/17/99

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCOS FOR MONUMENT "HUNTDAL".  
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF  
NORTHING: 844086.890(1) EASTING: 1019080.400(1)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT  
(GROUND TO GRID) IS: 0.9990557  
THE N.C. LAMBERT GRID BEARING AND  
LOCALIZED HORIZONTAL GROUND DISTANCE FROM  
"HUNTDAL" TO L- STATION 10+00.00 IS  
S 85° 39' 48.1" W 1.10569'  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

PROJECT REFERENCE NO. B-2848		SHEET NO. 4
R/W SHEET NO.		
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 26960 RECEM. SCHULER 8/30/06	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 934 HENRY WELLS 9/1/06	



STA 14+16 - 14+50 -L- LT  
STA 14+00 - 14+64 -YI- LT  
DDE = 40 CY

NOTE: INSTALL 4" DECK DRAIN SYSTEM  
12" OC FROM BEGIN BRIDGE TO  
END BRIDGE RT

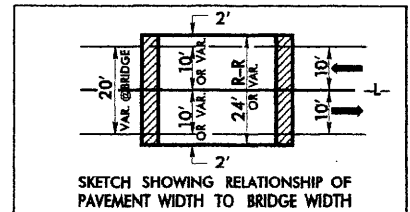
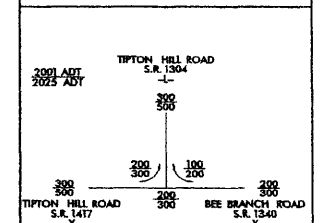
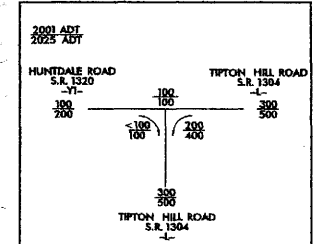
NOTE: SHOULDER BERM GUTTER  
-Y- STA 11+91.83 (LT) TO END BRIDGE (LT)  
END BRIDGE (RT) TO -Y- STA 13+09.95 (LT)  
END BRIDGE (LT) TO -YI- STA 13+85.23 (RT)  
END BRIDGE (RT) TO -L- STA 14+19.75 (RT)

-L- CURVE DATA		
PI Sta 13+99.65	PI Sta 16+05.95	
$\Delta = 41^{\circ} 55' 21.9''$ (RT)	$\Delta = 41^{\circ} 27.3''$ (RT)	
D = 30' 58" 14.5'	D = 6' 06" 53.3'	
L = 135.36'	L = 70.72'	
T = 70.87'	T = 35.38'	
**R = 185.00'	R = 937.00'	
SE = 0.06	SE = 0.04	
RO = 34.34'	RO = 39'	

-Y- CURVE DATA		
PI Sta 12+25.37	PI Sta 13+21.66	PI Sta 14+41.58
$\Delta = 2^{\circ} 36' 43.8''$ (LT)	$\Delta = 1^{\circ} 26' 35.8''$ (RT)	$\Delta = 17^{\circ} 18' 52.2''$ (RT)
D = 1' 41" 55.6"	D = 3' 42" 52.7"	D = 8' 40" 52.3"
L = 153.77'	L = 38.85'	L = 199.45'
T = 76.90'	T = 19.43'	T = 100.49'
R = 3,372.74'	R = 1,542.44'	R = 660.00'
SE = NC	SE = NC	SE = NC

-YI- CURVE DATA		
PI Sta 12+08.00	PI Sta 14+05.07	
$\Delta = 22^{\circ} 54' 43.0''$ (LT)	$\Delta = 13^{\circ} 07' 17.7''$ (RT)	
D = 12' 02" 12.9"	D = 10' 59" 50.2"	
L = 190.35'	L = 119.32'	
T = 96.46'	T = 59.92'	
R = 476.00'	R = 521.00'	
SE = 0.02	SE = 0.03	
RO = 32'	RO = 32'	

\*\* DESIGN EXCEPTION REQUIRED  
FOR HORIZONTAL CURVE

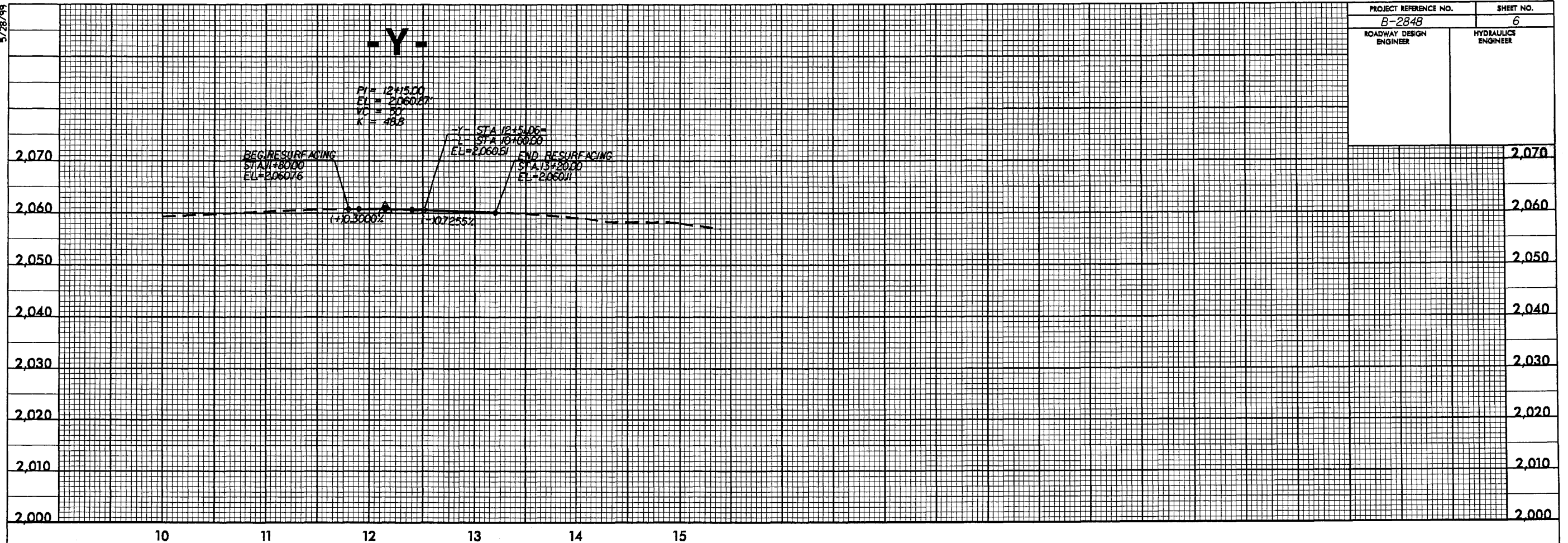


SEE SHEETS 5 & 6 FOR PROFILES

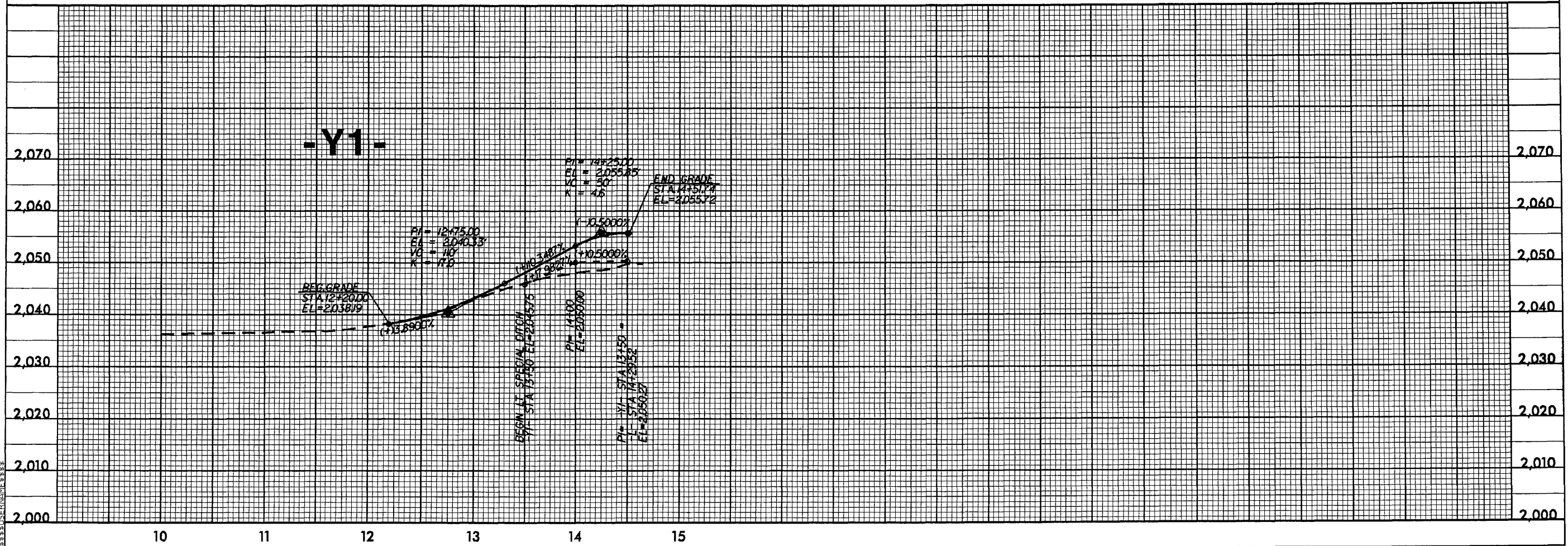




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2848.dwg



**Mitchell and Yancey Counties  
Bridge No. 143  
SR 1304 over the North Toe River  
Federal-Aid Project No. BRZ-1304 (4)  
State Project No. 8.2880401  
T.I.P. No. B-2848**

**CATEGORICAL EXCLUSION**

June, 2003

Documentation Prepared in  
Project Development and Environmental Analysis Branch by:

6/2/03

DATE



Stephanie Ledbetter Caudill  
Project Planning Engineer

6/2/03

DATE



Cynthia D. Sharer, P.E., Unit Head  
Project Planning Unit



**Mitchell and Yancey Counties  
Bridge No. 143  
SR 1304 over the North Toe River  
Federal-Aid Project No. BRZ-1304 (4)  
State Project No. 8.2880401  
T.I.P. No. B-2848**

**CATEGORICAL EXCLUSION**

**U.S. DEPARTMENT OF TRANSPORTATION**

**FEDERAL HIGHWAY ADMINISTRATION**

**AND**

**N.C. DEPARTMENT OF TRANSPORTATION**

**DIVISION OF HIGHWAYS**

6/20/03  
DATE

*Gregory J. Thorpe*  
for Gregory J. Thorpe, Ph.D., Manager  
Environmental Management Director, PDEA

6/30/03  
DATE

*Clarence W. Coleman, Jr.*  
for John F. Sullivan, III  
Division Administrator, FHWA

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Figures

Appendix

## **LIST OF FIGURES**

**Figure 1 - Site Location Map**

**Figure 2 - Aerial Photograph of Project**

**Figure 3&4 – Photographs of Bridge #143**

**Figure 5- Typical Bridge Cross Section**

## **Project Commitments**

**Mitchell/Yancey Counties  
Bridge No. 143  
SR 1304 Over North Toe River  
Federal Project BRZ-1304(4)  
State Project 8.2880401  
TIP No. B-2848**

### **Highway Division 13, Hydraulics Unit, Structure Design Unit**

In order to avoid and minimize environmental impacts associated with the replacement of Bridge No. 143, all standard procedures and measures, including NCDOT's Best Management Practices for Protection of Surface Waters and the Tennessee Valley Authority's (TVA) Water Management Standard Conditions will be strictly enforced during the construction stage of the project. Provisions to preclude contamination by toxic substances during the construction interval will also be strictly enforced.

1. In addition to NC DOT Best Management Practices, the contractor must submit a bridge demolition plan for approval by the Division 13 engineer prior to beginning bridge removal. Since some bridge debris will enter the water, the contractor must submit a work plan sealed by a PE. The contractor's work plan will detail the maximum amount of the bridge that can be safely removed dropping minimal portions into the water. Also, this plan will indicate any proposed use of explosives and the methods to be used to retrieve and dispose of all components of the existing bridge dropped into the water. The volume of structural material to be retrieved from the existing bridge will be approximately 150 cubic yards (114.61 cubic meters).
1. Construction will be accomplished so wet concrete does not contact water entering or flowing in the river. Demolition of the existing structure will be completed such that minimal asphalt or dirt fill from the existing deck enters the river. Any debris or construction material that falls into the river will be removed immediately.
3. Every effort will be made to minimize deck drainage, the overall footprint of bents, any scour problems, and any debris accumulation associated with the project.

### **Roadway Design Unit, Project Development and Environmental Analysis Branch, Roadside Environmental Unit, Highway Division 13, Structure Design Unit**

- 1 Upon completion of the project the existing approach fill will be removed to natural grade and the area will be planted with native grasses and/or tree species such as Hard Fescue/ or Bluegrass or as recommended by the division engineer.
2. Activities in the flood plain will be limited to those needed to construct the proposed bridge and remove the existing bridge. Areas used for borrow or construction by-products will not be located in floodplains.

3. Every effort will be made to minimize work pads in the flood plain.
4. During and after bridge demolition neither bridge debris, asphalt or dirt fill will be allowed to enter Waters of the United States. Silt fences, silt bags or other suitable sedimentation control measures may be used at the approval of the Division Engineer.

#### **Highway Division 13, Hydraulics, PD&EA, Structure Design Unit**

1. NCDOT will coordinate with the U.S. Fish and Wildlife Service to incorporate sufficient measures and monitoring, as required, in addition to those listed below, to avoid impacts to the endangered Appalachian Elktoe mussel (*Alasmodonta raveneliana*).
2. All Elktoe mussel species must be removed prior to construction. Bridge Construction may be subject to a moratorium. A Consultation in compliance with **Section (7a)** of the Endangered Species Act of 1973 will follow this CE document in order to more closely identify the specific course of action necessary to minimize impacts to the endangered Appalachian Elktoe Mussel species.
3. The NCDOT Project Development and Environmental Analysis Branch and the U.S. Fish and Wildlife Service will be invited to the pre-construction conference to discuss with the contractor the provisions of the Endangered Species Act of 1973 and penalties for violation of the Act.
4. Stringent erosion control measures included in the Division of Water Quality's High Quality Waters Erosion Control Guidelines will be implemented during all construction activities.
5. Riparian vegetation will be maintained wherever possible, especially large trees.
6. If riparian areas are disturbed, they will be revegetated with native species as soon as possible after construction.
7. Prior to construction the contractor will be required to give notification of the construction initiation date to the U.S. Fish and Wildlife Service, N.C. Wildlife Resources Commission, and the Tennessee Valley Authority.
8. Pre-let surveys will be performed at the bridge for occurrence of the Appalachian Elktoe (*Alasmodonta raveneliana*).
9. The North Toe River is classified as a Trout water; North Carolina regulations entitled Design Standards in Sensitive Watersheds shall be implemented during the design and construction of this project, as applicable. A letter of notification, with reference to impacts to mountain trout water habitat, will be provided to the U.S. Army Corps of Engineers - Asheville Regulatory Field Office and the N.C. Wildlife Resources Commission (WRC) office prior to construction of the project.

Categorical Exclusion Commitments  
May 2003

Mitchell and Yancey Counties  
Bridge No. 143  
SR 1304 over North Toe River  
Federal-Aid Project No. BRZ-1304 (4)  
State Project No. 8.2880401  
T.I.P. No. B-2848

Bridge No. 143 in Mitchell and Yancey Counties is listed in the North Carolina Department of Transportation (NCDOT) 2002-2008 Transportation Improvement Program (TIP) as TIP No. B-2848. The purpose of this project is to replace Bridge No. 143 due to its poor condition and substandard design.

This project is being processed as a Federal Categorical Exclusion. Based on the assessment of the existing human and natural environment, it is concluded that no significant adverse environmental effects will result from the replacement of Bridge No. 143. Refer to Figures 1 through 4 for location and illustrations of the project area and existing bridge location.

All measurements contained in this report are in System International metric units, approximate metric system equivalent units are indicated in parentheses next to the English System equivalents.

**I. SUMMARY OF ENVIRONMENTAL COMMITMENTS**

The Environmental Commitments Listed on pages 1 and 2 are intended to minimize impacts to the Appalachian Elktoe Mussel Species and other species dependent upon the North Toe River.

**II. SUMMARY OF RECOMMENDATIONS**

The existing one-lane structure (Bridge No. 143) will be replaced with a multi-span two-lane bridge on new location approximately 50 feet (15.2 meters) downstream of the existing bridge (Alternate B as shown in Figure 2). The new bridge will be approximately 350 feet (108 meters) in length and will have a clear roadway width of 24 feet (7.2 meters) consisting of two travel lanes with 2 feet (0.6 meter) shoulders on each side of the bridge.

The existing bridge will remain in place to maintain traffic during construction. It will be removed after construction is complete.

The estimated cost of this project, based on current prices, is \$1,216,000. This amount includes \$66,000 for right-of-way acquisition and \$1,250,000 for construction.

**III. EXISTING CONDITIONS**

Bridge No. 143 is located on SR 1304 approximately 1.4 mi (2.3 kilometers) south of NC 197 in the community of Hunt Dale, North Carolina. The bridge crosses over the North Toe River which divides

Mitchell and Yancey Counties. Refer to Figure 1 for the existing bridge location and Figures 2 through 4 for illustrations of the project area.

#### **BRIDGE INFORMATION**

Bridge No. 143 is a one-lane bridge constructed in 1922. It has five spans, totaling 367 feet (111.9 meters) in length, and has a clear roadway width of 12 feet (3.6 meters). The superstructure of the bridge consists of a reinforced concrete deck, an asphalt wearing surface, and metal guardrails. The substructure consists of reinforced concrete earth filled spandrel arches, reinforced concrete abutments, and reinforced concrete piers. Bridge No. 143 was constructed on a vertical curve. The crest of this curve is located approximately in the middle of the bridge and has estimated 1.0 percent grades on each side of the crest. The bridge deck in the middle of the bridge is approximately 28 feet (8.5 meters) above the river bottom. The bridge has no horizontal curvature.

According to the 2002 NCDOT Bridge Inspection Report, the bridge has a sufficiency rating of 23.0 and is considered structurally deficient. The original bridge rails were replaced with metal guardrails in 1980 due to their deteriorated condition.

There are currently no posted restrictions on the bridge.

#### **NORTH TOE RIVER**

Bridge No. 143 is located in a meander of the North Toe River approximately 2,500 feet (762 meters) upstream from the river's confluence with the Cane River. At the existing bridge crossing, the North Toe River has a drainage area of approximately 442 square miles (1,145 square kilometers) consisting of mostly steep, heavily wooded, mountainous terrain with scattered residential development. The river is approximately 180 feet (55 meters) wide and has a variable depth of approximately 3 feet (1.0 meters) at the existing bridge.

Although Mitchell and Yancey Counties are participants in the Federal Emergency Management Agency (FEMA) National Flood Insurance Regular Program, the North Toe River within the project area was not included in the detailed FEMA study. Design flows for this project were estimated using drainage areas calculated from USGS gauge and rural regression equations from the USGS Water Resources Investigation Report 96-4085.

#### **ROADWAY INFORMATION**

SR 1304 begins in Yancey County at the south end of Bridge No. 143, crosses the North Toe River into Mitchell County and extends eastward ending at NC 197. It is classified as a minor collector in the Statewide Functional Classification System and primarily serves local traffic. This two lane highway is approximately 18.0 feet (5.4 meters) in width and has variable width unpaved shoulders, except over Bridge No. 143. SR 1304 is a one-lane roadway over the bridge serving two-way traffic controlled by a stop sign on the south approach of the bridge. The width of SR 1304 measures 3.6 meters (12 ft) over the bridge.

SR 1304 intersects SR 1417 and SR 1340 at a 65 degree angle on the south approach of the bridge. It is tangent across the river but makes a sharp (110 degrees) turn at the north approach. SR 1320 intersects SR 1304 at the north end of the existing bridge in this sharp curve. Refer to Figure 2 for illustration of these intersections.

Vehicles must enter and exit the one lane bridge at sharp angles. It is likely that large trucks have difficulty negotiating the turns at each end of the existing bridge.

The posted speed limit on SR 1304 in the vicinity of the bridge is 35 mph.

The 2002 average daily traffic volume on SR 1304 over Bridge No. 143 is estimated to be 200 vehicles per day (vpd) which includes 2 percent TTST vehicles and 3 percent dual-tired (Dual) vehicles. The 2025 design year average daily traffic volume over the bridge is expected to be 300 vpd.

#### GENERAL INFORMATION

This project is located in a rural setting consisting of either scattered residential and commercial development or is undeveloped mountainous terrain. The small community of Hunt Dale is located in the vicinity of the bridge. This community consists of several single family residences, a general store/gas station, and a church. A CSX Railroad line runs through the community paralleling the north side of the North Toe River. Both Mitchell and Yancey Counties have experienced very little growth in the past and are not expected to substantially increase in population in the future.

According to school officials, no school buses cross Bridge No. 143.

Two accidents were reported within the project area between September 1, 1992 and August 31, 2002.

The French Broad Electric Membership Corporation has aerial electrical service lines at both ends of the existing bridge and aerial electrical service crossing the North Toe River just upstream. There are no utilities attached to Bridge No. 143. Utility impacts for this project are expected to be "low".

There are remnants of an old sawmill located at the northeast end of the existing bridge.

There are no U.S. Geological Survey geodetic survey markers located on or near Bridge No. 143.

No major developments or roadway improvements are planned that would impact the historical growth rates or travel patterns in the area of this project.

#### IV. ALTERNATIVES

Three replacement alternatives, a "Do-Nothing" alternate, and a "Rehabilitation" alternate were considered for this project.

Due to the poor condition of the existing structure, the "Do-Nothing" alternate and the "Rehabilitation" alternate were eliminated from further study.

Based on the lack of a suitable off-site detour route, no alternatives involving an off-site detour were considered. Traffic will be maintained on-site using the existing bridge during construction.



An "in-place" bridge replacement, using an on-site detour, will be cost prohibitive due to the cost of a temporary detour bridge. Based on this, an "in-place" bridge replacement was not considered.

Three alternatives (A, B and C) were studied for replacing Bridge No. 143. Each of these alternatives consists of a multi-span bridge having a clear roadway width of 24 feet (7.2 meters) which includes two travel lanes totaling 20 feet (6.0 meters) in width and a 2 feet (0.6 meter) shoulder on each side of the bridge. The roadway approaches will have a 20 feet (6.0 meter) pavement width and 2 feet (0.6 meter) unpaved shoulders.

The following is a detailed description of each of the three study alternates (as shown in Figure 2):

#### ALTERNATE A

This alternative replaces Bridge No. 143 with a new bridge located approximately 500 feet (152.4 meters) downstream of the existing structure. The proposed river crossing is in a narrow section of the North Toe River and would provide a shorter bridge than other alternates under study.

Alternate A will require the grade of SR 1320 to be raised approximately 15 feet (4.6 meters) above its existing elevation from west of the proposed bridge to SR 1304, a distance of approximately 550 feet (168 meters). Raising the elevation of SR 1320 will result in longitudinal encroachment upon the North Toe River and upon the CSX Railroad tracks. Based on review of Mitchell County tax maps, it appears SR 1320 is on CSX Railroad right of way.

Alternate A is not recommended due to the impacts to the North Toe River and to the CSX Railroad.

#### ALTERNATE B (Recommended)

Alternate B will replace the existing bridge with a new bridge located approximately 50 feet (15.2 meters) downstream of the existing structure. The existing grade of SR 1320 on the north side of the river will be raised to match the existing elevation of SR 1304 and the north end of the proposed bridge.

This alternative will be less costly than Alternate C and will have less impact on the natural environment than Alternate A or C. Alternate B will have a shorter bridge than Alternate C because it will be downstream of the meander in the North Toe River and west of the horizontal curve in SR 1417/SR 1340. Alternate B will not encroach upon McKinney Branch located north of SR 1340 and east of the existing bridge.

#### ALTERNATE C

This alternative replaces Bridge No. 143 with a new bridge located approximately 50 feet (15.2 meters) upstream of the existing structure. Due to the horizontal curvatures of SR 1417/SR 1340 south of the river and of SR 1320/SR 1304 north of the river, a longer bridge would be required for this alternate.

A small tributary, McKinney Branch, is located on the north side of SR 1340 approximately 90 feet (27 meters) upstream of the existing bridge. McKinney Branch will be relocated by Alternate C. Alternate C will also impact remnants of an old sawmill located on the north side of the river approximately 130 feet (40 meters) upstream of the existing bridge.

This alternate will require the relocation of aerial electrical service lines extending over the North Toe River located just upstream of the existing bridge.

Alternate C is not recommended due to the increased cost of a longer bridge and to the impacts to McKinney Branch.

## **V. ESTIMATED COSTS**

The estimated cost of Alternates A, B and C, based on 2002 dollars, are shown in Table 1.

**TABLE 1  
ESTIMATED PROJECT COSTS**

	<b>Alternate A</b>	<b>Alternate B (Recommended)</b>	<b>Alternate C</b>
Structure (proposed)	\$ 489,600	\$ 622,080	\$ 685,440
Roadway Approaches	\$ 361,799	\$ 232,266	\$ 179,590
Structure Removal (existing)	\$ 37,233	\$ 37,233	\$ 37,233
Miscellaneous and Mobilization	\$ 242,368	\$ 203,420	\$ 189,776
Engineering and Contingencies	\$ 169,000	\$ 155,000	\$ 158,000
Right-of-Way and Utilities	\$41,500	\$41,900	\$42,600
Total	\$1,341,500	\$1,291,900	\$1,292,600

The estimated cost of the project, as shown in the 2002-2008 TIP, is \$1,452,000,000 (1,250,000 for construction, \$202,000 for right-of-way, with the remainder for planning studies).

## **VI. RECOMMENDED IMPROVEMENTS**

Bridge No. 143 will be replaced on new location (Alternate B) with a multi-span bridge located approximately 50 feet (15.2 meters) downstream of the existing structure (see Figure 2). The new bridge will be approximately 350 feet (108 meters) in length and will be placed at approximately the same elevation as the existing structure. The bridge will have a clear roadway width of 24 feet (7.2 meters) which includes two travel lanes totaling 20 feet (6.0 meters) in width and a 2 feet (0.6 meter) shoulder on each side of the bridge. The roadway approaches will have a pavement width of 20 feet (6.0 meter) and 2 feet (0.6 meter) unpaved shoulders on each side.

The length and height of the proposed structure may be increased or decreased as necessary to accommodate peak flows as determined by further hydraulic studies and to minimize impacts to endangered species or their habit.

The existing bridge will remain in place to maintain traffic during construction. It will be removed after construction is complete.

## **VII. ANTICIPATED DESIGN EXCEPTION**

A design exception for the design speed will be required for this project due to the horizontal curves on each end of the new bridge. The construction costs and environmental impacts associated with providing a design speed of 35 mph, the posted speed limit over the bridge, will be excessive. The design speed of this project will be less than 30 mph.

## **VIII. NATURAL RESOURCES**

The purpose of studying natural resources is to provide an evaluation of biological resources in the immediate area of potential project impact. Specifically, the tasks performed for this study include: 1) an assessment of biological features within the study corridor including descriptions of vegetation, wildlife, protected species, wetlands, and water quality; 2) an evaluation of probable impacts resulting from construction; and 3) a preliminary determination of permit needs.

### **Methods**

Materials and research data in support of this investigation were derived from a number of sources including applicable U.S. Geological Survey (USGS) 7.5 minute quadrangle topographic mapping (Hunt Dale, NC), U.S. Fish and Wildlife Service (FWS) National Wetlands Inventory mapping, Natural Resources Conservation Service draft soils mapping (USDA Unpublished), and recent aerial photography (scale 1:1200).

The site was initially visited on February 6, 1997 and several follow-up visits were made to survey for protected species. The study corridor was walked and visually surveyed for significant features. The study corridor is approximately 305 by 1000 by 600 feet (183 meters). Impact calculations for each alternate are based on right-of-way width, which is approximately 80 feet (24 meters) for each alternate; actual impacts will be limited to construction limits and will be less than those shown for right-of-way. Special concerns evaluated in the field include potential habitat for protected species, wetlands, and water quality protection in the North Toe River.

Plant community descriptions are based on a classification system utilized by North Carolina Natural Heritage Program (NHP) (Schafale and Weakley 1990). When appropriate, community classifications were modified to better reflect field observations. Vascular plant names follow nomenclature found in Radford *et al.* (1968). Jurisdictional areas were identified using the three parameter approach (hydrophytic vegetation, hydric soils, wetland hydrology) following U.S. Army Corps of Engineers (COE) delineation guidelines (DOA 1987). Jurisdictional areas were characterized according to a classification scheme established by Cowardin *et al.* (1979). Habitat used by terrestrial wildlife and aquatic organisms, as well as expected population distributions, were determined through field observations, evaluation of available habitat, and supportive documentation (Martof *et al.* 1980, Webster *et al.* 1985, Menhinick 1991, Hamel 1992, Rohde *et al.* 1994). Water quality information for area streams and tributaries was derived from the North Carolina Department of Environment, Health and Natural Resources (DEHNR), Division of Water Quality (DEM 1989, DEM 1993, DEM 1994). Quantitative sampling was not undertaken to support existing data.

The most current FWS listing of federal protected species with ranges which extend into Mitchell and Yancey Counties was obtained prior to initiation of the field investigation. In addition, NHP records

documenting presence of federal or state listed species were consulted before commencing the field investigation.

#### Physiography and Soils

The study corridor is located in the Mountain physiographic province. Topography is characterized by strongly sloping to very steep uplands with narrow floodplains along drainages. Elevations in the study corridor range from approximately 2040 feet (620 meters) above sea level along the river to approximately 2080 feet (635 meters) along the slope southwest of the bridge (USGS Hunt Dale, NC quadrangle).

Soils in the study corridor are dominated by the Biltmore sand (0 to 3 percent slope) mapping unit along the inside bend of the river, Unison loam (15 to 30 percent slopes) mapping unit along the outside bend of the river, and the Buladean-Chestnut complex (50 to 95 percent slopes) mapping unit along the slope southwest of the bridge. The Biltmore sand series (*Typic Udipsammments*) is a well drained to moderately well drained, non-hydric series located on floodplains and is subject to periodic flooding. The Unison loam series is a well drained, non-hydric series found on high stream terraces, benches, coves, and colluvial fans. The Buladean soils and Chestnut soils (*Typic Dystrochrepts*) are well drained, non-hydric soils found on side slopes.

### **WATER RESOURCES**

#### Waters Impacted

The study corridor is located within sub-basin 040306 of the French Broad River Basin (DEM 1994). This area is part of USGS accounting unit 060101 of the Tennessee River Region. Bridge No.143 crosses the North Toe River approximately 2500 feet (762 meters) upstream from its confluence with the Cane River; the Nolichucky River is formed at this confluence. A small tributary, McKinney Branch, is also present within the study corridor. McKinney Branch enters the North Toe River approximately 90 feet (27 meters) upstream from the bridge. The North Toe River section from the town of Spruce Pine water supply intake downstream to the Nolichucky River has been assigned Stream Index Number 7-2-(27.7) by the North Carolina Department of Environment, Health and Natural Resources (DEHNR), Division of Water Quality (DWQ). McKinney Branch has been assigned Stream Index Number 7-2-71.

#### Stream Characteristics

The North Toe River is a large mountain river with swift flow over sandy and rocky substrate. Gravel bars are present within the channel downstream from the bridge, and large rock outcrops are present upstream and downstream from the bridge. A series of submerged rock ledges is present beginning approximately 160 feet (49 meters) downstream from the bridge. The North Toe River is approximately 180 feet (55 meters) wide at the existing bridge, but widens to approximately 200 feet (61 meters) immediately upstream and downstream within the study corridor. River depth is dependent on hydrologic conditions, and appears to be about 3 feet (0.9 meters) at the bridge. Little or no rooted aquatic vegetation is apparent in the river channel, but some organic debris (*i.e.*, branches, leaves) was apparent. Extensive woody debris has been placed or has accumulated on the left bank upstream from the bridge, which has in turn served to trap a large amount of sand and sediment.

McKinney Branch, a perennial stream which roughly parallels SR 1340, flows under a small bridge on SR 1340 and through a culvert under a driveway leading to private residences to empty into the North Toe River approximately 90 feet (27 meters) upstream from the existing bridge. McKinney Branch varies in

width from 5 feet (1.5 meters) upstream from the culvert, to 3 feet (0.9 meters) downstream from the culvert. Stream flow on the date of the site visit was swift with 0.2 to 0.5 feet (0.1 to 0.2 meters) of water flowing over mostly sandy substrate upstream from the culvert, and sandy and rocky substrate downstream from the culvert. The banks within the lower reach within the study corridor have been substantially impacted by residential development and roadway maintenance.

A small, intermittent drain approximately 1 to 3 feet (0.3 to 0.9 meters) wide flows from a culvert under SR 1304 into the North Toe River approximately 380 feet (116 meters) upstream from Bridge No. 143. Water depth is approximately 0.3 feet (0.1 meters) with swift flow over sandy, mostly vegetated substrate.

#### Best Usage Classifications and Water Quality

Classifications are assigned to waters of the State of North Carolina based on the existing or contemplated best usage of various streams or segments of streams in the basin. A best usage classification of **C Tr** has been assigned to the North Toe River from the town of Spruce Pine water supply intake downstream to the Nolichucky River, and to McKinney Branch from its source to the North Toe River (DEM 1993). The designation **C** denotes that appropriate uses include aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. Secondary recreation refers to human body contact with waters on an infrequent or incidental basis. The **Tr** designation is used for trout waters characterized as waters suitable for natural trout propagation and maintenance of stocked trout.

No High Quality Waters (**HQW**), Outstanding Resource Waters (**ORW**), **WS I**, or **WS II** Waters occur within 1 mi (1.6 kilometers) of the study corridor. Neither the North Toe River nor McKinney Branch is designated as a North Carolina Natural and Scenic River, nor as a national Wild and Scenic River.

There are several permitted point source dischargers upstream from the study corridor (DEM 1989, DEM 1994). The nearest facility is more than 10 mi upstream. These facilities, along with flows (in MGD), are presented in the following table:

<u>Facility</u>	<u>NPDES#</u>	<u>Receiving Stream</u>	<u>County</u>	<u>Flow</u>
Bakersville WWTP	NC0025461/001	Cane Creek	Mitchell	0.0750
Feldspar Corp	NC0000353/001	North Toe River	Mitchell	3.5000
K-T Feldspar	NC0000400/001	North Toe River	Mitchell	1.7300
Ledbetter Oil Co	NC0076911/001	White Oak Creek	Avery	0.0045
Spruce Pine WWTP	NC0021423/001	North Toe River	Mitchell	0.6000
Unimin Corp-Mica	NC0000361/001	North Toe River	Avery	2.1600
Unimin Corp-Quartz	NC0000175/001	North Toe River	Mitchell	3.6100

No significant non-point discharges were noted in the study corridor.

Despite the number of permitted discharges upstream, the water quality of the North Toe River in the vicinity of the study corridor has been rated as Good to Good-Fair based on ratings assigned by the Benthic Macroinvertebrate Ambient Network (BMAN). BMAN addresses long-term trends in water quality at fixed monitoring sites by sampling for selected benthic macroinvertebrates and then evaluating species richness and overall biomass to assess overall water quality (DEM 1989). In addition to BMAN sampling stations, DWQ has additional benthic macroinvertebrate sampling stations in the North Toe River upstream and downstream from the study corridor. In 1992, sampling stations in the North Toe River upstream from

the study corridor received Good or Good-Fair bioclassifications, and a station downstream from the study corridor received a Good bioclassification (DEM 1994).

Another measure of water quality being used is the North Carolina Index of Biotic Integrity (NCIBI), which assesses biological integrity using the structure and health of the fish community. There is a NCIBI station on the North Toe River along NC 197, which is approximately 1.3 to 2.6 miles (2.1 to 4.2 kilometers) upstream from the study corridor. This site received a rating of Good in 1992 (DEM 1994).

#### Anticipated Impacts to Water Resources

Stringent erosion control measures included in the Division of Water Quality's High Quality Waters Erosion Control Guidelines will be implemented during all construction activities. In order to avoid and minimize environmental impacts associated with the replacement of Bridge No. 143, all standard procedures and measures, including NCDOT's Best Management Practices for Protection of Surface Waters and the Tennessee Valley Authority's (TVA) Water Management Standard Conditions will be strictly enforced during the construction stage of the project.

Because a federally endangered freshwater mussel, the Appalachian elktoe (*Alasmodonta raveneliana*), has been found in the vicinity of the existing bridge, the above design and construction standards should be stringently followed during the life of this project to minimize impacts to this species.

No adverse long-term impacts to water resources are expected to result from proposed improvements. The proposed bridge replacement will allow for continuation of present stream flow in the North Toe River, thereby protecting stream integrity. Alternatives A and B will avoid impacts to McKinney Branch; however, a small section of McKinney Branch is located within the right-of-way for Alternative C. The small, unnamed intermittent tributary to the North Toe River has been avoided by all project alternatives and will not be impacted.

## **BIOTIC RESOURCES**

### Plant Communities

Three distinct plant communities were identified within the study corridor: hardwood forest, riverine bar, and maintained/disturbed areas. These plant communities are described below.

**Hardwood Forest** - Hardwood forest is located on the steep slope near the western end of the bridge and in a narrow band between SR 1417 and the river. Within the study corridor, this community is represented by ecotonal edge; no forest interior is affected. In addition to the hardwoods, there are a few needle-bearing canopy trees. Canopy species include white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadense*), black birch (*Betula lenta*), northern red oak (*Quercus rubra*), black locust (*Robinia pseudoacacia*), tulip tree (*Liriodendron tulipifera*), and American sycamore (*Platanus occidentalis*). Subcanopy trees are sparse and include black cherry (*Prunus serotina*), maple (*Acer* sp.), American beech (*Fagus grandifolia*), and canopy species. Shrubs include rosebay (*Rhododendron maximum*), witch hazel (*Hamamelis virginiana*), and ironwood (*Carpinus caroliniana*). Christmas fern (*Polystichum acrostichoides*) and rosettes of various perennials were growing among the hillside rocks.

**Riverine Bar** - This community is represented by two small riverine bars located approximately 91 to 152 meters (300 to 500 ft) downstream from the existing bridge. Extensive sand deposits may periodically cover much of the rocky substrate. Vegetative cover is sparse and dominated by shrubs. Species present along the river such as ash-leaved maple (*Acer negundo*) and silky dogwood (*Cornus amomum*) may become established as shrubs but are not expected to mature into trees due to frequent overwash and scouring.

**Maintained/Disturbed Areas** - This community includes the roadsides, mowed lawns, garden plots, and disturbed river bank areas. Scattered trees remain in this community and include black locust, American sycamore, ash-leaved maple, red maple (*A. rubrum*), and black walnut (*Juglans nigra*). Herbaceous species include evening primrose (*Oenothera biennis*), goldenrods (*Solidago* spp.), asters (*Aster* spp.), wingstem (*Verbesina alternifolia*), giant ragweed (*Ambrosia trifida*), Japanese knotweed (*Polygonum cuspidatum*), jimson weed (*Datura stramonium*), lovevine (*Cuscuta* sp.), panic grass (*Panicum* sp.), Johnson grass (*Sorghum halapense*), wild-rye (*Elymus virginicus*), and foxtail grass (*Setaria* sp.).

#### Anticipated Impacts to Plant Communities

Anticipated impacts to plant communities are estimated based on the amount of each plant community present within the projected right-of-way; actual impacts within construction limits will be less. A summary of potential plant community impacts is presented in Table 2.

**TABLE 2**  
**ESTIMATED PLANT COMMUNITY IMPACTS**  
**(in Acres)**

Plant Community	Alternate A	Alternate B (Recommended)	Alternate C
Hardwood Forest	0.47 (0.19)	0.25 (0.10)	0.25 (0.10)
Riverine Bar	0.10 (0.04)	0	0
Maintained/Disturbed	1.18 (0.48)	1.33 (0.54)	1.43 (0.58)
Total	1.75 (0.71)	1.58 (0.64)	1.68 (0.68)

**Note:** Hectares shown in parentheses.

Permanent impacts to plant communities as a result of bridge replacement are generally restricted to narrow strips adjacent to the existing bridge and roadway approach segments. The total potential impact to plant communities based on right-of-way is similar among the three alternatives, with ranges between 1.58 ac (0.64 hectares) for Alternative B to 1.75 ac (0.71 hectares) for Alternative A. However, most of this potential impact for each alternative is within maintained/disturbed areas and does not infringe upon

adjacent natural communities. Alternative A has a higher relative impact to natural communities (32 percent of total potential impact) than either Alternative B or C (16 and 15 percent of total potential impact, respectively).

## Wildlife

### Terrestrial

Most of the study corridor consists of maintained/disturbed areas. Birds observed within or adjacent to the corridor include northern cardinal (*Cardinalis cardinalis*), song sparrow (*Melospiza melodia*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), Carolina wren (*Thryothorus ludovicianus*), eastern bluebird (*Sialis sialis*), pileated woodpecker (*Dryocopus pileatus*), white-breasted nuthatch (*Sitta carolinensis*), and Carolina chickadee (*Parus carolinensis*). Other birds, such as red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), eastern screech owl (*Otus asio*), tufted titmouse (*Parus bicolor*), American robin (*Turdus migratorius*), northern oriole (*Icterus galbula*) and indigo bunting (*Passerina cyanea*) may be expected to occur within the ecotonal woodland and maintained/disturbed communities within the study corridor.

Mammal sign (tracks) observed within the study corridor included cottontail (*Sylvilagus* sp.), domestic dog (*Canis familiaris*), and house cat (*Felis catus*). Other species expected include gray squirrel (*Sciurus carolinensis*), opportunistic species such as Virginia opossum (*Didelphis virginianus*) and raccoon (*Procyon lotor*), and various rodents. Due to the season in which the field work was conducted, no terrestrial reptile or amphibian species were documented within the study corridor.

### Aquatic

Limited dip-netting within the study corridor did not yield any fish; however, the varied riverine habitat and good water quality is expected to support numerous species of minnows, darters, and other fish. Species that may be present include central stoneroller (*Camptostoma anomalum*), whitetail shiner (*Cyprinella galacturus*), teleope and mirror shiners (*Notropis telescopus* and *N. spectrunculus*), fatlips minnow (*Phenacobius crassilabrum*), white sucker (*Catostomus commersoni*), black redhorse (*Moxostoma duquesnei*), greenside darter (*Etheostoma blennioides*), sharphead darter (*E. acuticeps*), banded darter (*E. zonale*), gilt darter (*Percina evides*), and mottled sculpin (*Cottus bairdi*). Potential game fish which may be present within the study corridor include rock bass (*Ambloplites rupestris*), redbreast sunfish (*Lepomis auritus*), smallmouth bass (*Micropterus dolomieu*), and channel catfish (*Ictalurus punctatus*) (Menhinick 1991, Rohde et al. 1994). There are no anadromous fish within this system.

Aquatic macroinvertebrates observed in the stream included the Asiatic clam (*Corbicula fluminea*). Stream bank surveys did not yield any shell fragments which could indicate freshwater mussel presence within the study corridor; however, NHP files indicate that Appalachian elktoe (*Alasmidonta raveneliana*) and wavy-rayed lampmussel (*Lampsilis fasciola*) have been found within or adjacent to the study corridor. Field evaluations indicate that habitat for these species is present within the study corridor.

Limited surveys did not result in documenting any salamanders in the stream. The stream provides suitable habitat for a few aquatic and semi-aquatic reptiles and amphibians such as shovelnose salamander (*Leurognathus marmoratus*), blackbelly salamander (*Desmognathus quadromaculatus*), and queen snake (*Regina septemvittata*).



### Anticipated Impacts to Wildlife

Due to the limited extent of infringement on natural communities, the proposed bridge replacement will not result in significant loss or displacement of known terrestrial animal populations. Potential down-stream impacts to aquatic habitat will be avoided by bridging the system to maintain regular flow and stream integrity. In addition, temporary impacts to downstream habitat from increased sediment during construction will be minimized by implementing the NCDOT's *Best Management Practices for Surface Waters* and North Carolina regulations entitled *Design Standards in Sensitive Watersheds*, as practicable, during construction. These measures should be stringently followed to reduce impacts to the Appalachian elktoe, a federally-endangered species.

## **SPECIAL TOPICS**

### Waters of the United States

Surface waters within the embankments of the North Toe River and McKinney Branch are subject to jurisdictional consideration under Section 404 of the Clean Water Act as "waters of the United States" (33 CFR 328.3). The waters of the North Toe River and McKinney Branch exhibit characteristics of riverine, upper perennial, unconsolidated bottom, permanently flooded waters (R3UBH).

Alternatives B and C will bridge the open waters of the North Toe River, negating the need for direct encroachment into riverine waters. Alternative A may impact 00.17 ac. (07 hectares) of open water area of the North Toe River due to encroachments associated with raising the roadbed northwest of the bridge. This encroachment into riverine waters may extend up to 30 feet (9 meters) from shore along approximately 600 feet (183 meters) of river bank. This encroachment for Alternative A will be required for necessary approach improvements to SR 1320; the remaining open waters of the North Toe River would be bridged. The open waters of the North Toe River within the right-of-way for each alternative are presented in Table 3. The open waters for Alternative C include the open waters of McKinney Branch (less than 0.01 ac (0.004 hectares)) within the Alternative C right-of-way.

**TABLE 3**  
**POTENTIAL OPEN-WATER IMPACTS WITHIN PROPOSED RIGHT-OF-WAY**  
**(Acres)**

Plant Community	Alternate A	Alternate B (Recommended)	Alternate C
Bridging	0.28 (0.11)	0.37 (0.15)	0.33 (0.13)
Fill	0.17 (0.07)	0	0
Total	0.45 (0.18)	0.37 (0.15)	0.33 (0.13)

**Note:** Hectares shown in parentheses.

Wetlands subject to review under Section 404 of the Clean Water Act (33 U.S.C. 1344) are defined by the presence of three primary criteria: hydric soils, hydrophytic vegetation, and evidence of hydrology at or near the surface for a portion (12.5 percent) of the growing season (DOA 1987). Based on the three parameter

approach, limited jurisdictional wetlands occur within the study corridor within the linear, intermittent drain located upstream from the bridge. This drain exhibits characteristics of palustrine, emergent wetlands (PEM), with evidence of hydric soil characteristics (i.e., gleying), intermittent surface flooding and saturation at the surface, and dominance by hydrophytic herbaceous vegetation. This drain covers an area approximately 110 by 3 feet (34 by 1 meters); however, none of the alternatives will impact this jurisdictional area.

#### Permits

This project is being processed as a Categorical Exclusion (CE) under Federal Highway Administration (FHWA) guidelines. Nationwide Permit (NWP) #23 [33 CFR 330.5(a)(23)] has been issued by the COE for CEs due to expected minimal impact. DWQ has issued a General 401 Water Quality Certification for NWP #23. However, use of this permit will require written notice to DWQ. In the event that NWP #23 will not suffice, minor impacts attributed to bridging and associated approach improvements are expected to qualify under General Bridge Permit 031 issued by the Wilmington COE District. Notification to the Wilmington COE office is required if this general permit is utilized.

Mitchell and Yancey Counties are among the twenty-five mountain counties designated as having trout waters. The COE has implemented discretionary authority to override certain nationwide and general permits which authorize the discharge of dredged or fill materials into North Carolina designated trout waters. Generally, projects involving trout stream infringement, including all waters upstream to and above their headwaters, can be processed under either General Bridge Permit 031 or Individual Permit. Projects in trout waters require review by the DEHNR, Wildlife Resources Commission (WRC). Neither the North Toe River section within and downstream from the study corridor, nor the receiving waters of the Nolichucky River are designated by the WRC as Public Mountain Trout Waters.

Review of this project by the Tennessee Valley Authority (TVA) is required under Section 26a of the TVA Act. The TVA will require the use of Best Management and Best Engineering Practices as outlined in its *Water Management Standard Conditions*.

Foundation test borings, if required, will be approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities. Written concurrence from the N.C. Wildlife Resources Commission and the COE will be required.

#### Mitigation

Compensatory mitigation is not proposed for this project due to the limited nature of project impacts. However, utilization of the NCDOT's *Best Management Practices for Surface Waters*, as practicable, during construction is recommended in an effort to minimize impacts.

## PROTECTED SPECIES

### Federal Protected Species

Species with the federal classification of Endangered (E) or Threatened (T), or officially proposed (P) for such listing, are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The following federal protected species are listed for Mitchell (M) and Yancey (Y) Counties (February 24, 2003 FWS list):

<u>Common Name</u>	<u>Scientific Name</u>	<u>County</u>	<u>Status</u>
Bog turtle	<i>Clemmys muhlenburgii</i>	Y	P
Virginia big-eared bat	<i>Corynorhinus townsendii</i>	Y	E
Peregrine falcon	<i>Falco peregrinus</i>	Y	E
Eastern cougar	<i>Felis concolor couguar</i>	Y	E
Carolina northern flying squirrel	<i>Glaucomys sabrinus coloratus</i>	M, Y	E
Indiana bat	<i>Myotis sodalis</i>	M	E
Appalachian elktoe	<i>Alasmidonta raveneliana</i>	M, Y	E
Spreading avens	<i>Geum radiatum</i>	M, Y	E
Roan Mountain bluet	<i>Houstonia montana</i>	Y	E
Heller's blazing star	<i>Liatris helleri</i>	M	T
Blue Ridge goldenrod	<i>Solidago spithamea</i>	M	T
Virginia spiraea	<i>Spiraea virginiana</i>	M, Y	T
Rock gnome lichen	<i>Gymnoderma lineare</i>	M, Y	E
Spruce-fir moss spider	<i>Microhexura montivaga</i>	M, Y	E

**Bog Turtle** - The bog turtle is a small turtle reaching an adult size of approximately 3 to 4 inches (8 to 10 centimeters). This otherwise darkly-colored species is readily identifiable by the presence of a bright orange or yellow blotch on the sides of the head and neck (Martof *et. al.* 1980). The bog turtle has declined drastically within the northern portion of its range due to over-collection and habitat alteration. As a result, the FWS officially proposed in the January 29, 1997 Federal Register (62 FR 4229) to list bog turtle as threatened within the northern portion of its range, and within the southern portion of its range, which includes North Carolina, the bog turtle is proposed for listing as threatened due to similarity of appearance to the northern population. The proposed listing would allow incidental take of bog turtles in the southern population resulting from otherwise lawful activity.

The bog turtle is typically found in bogs, marshes, and wet pastures, usually in association with aquatic or semi-aquatic vegetation and small, shallow streams over soft bottoms (Palmer and Braswell 1995). In North Carolina, bog turtles have a discontinuous distribution in the Mountains and western Piedmont. NHP records do not indicate the bog turtle has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** The bog turtle is listed as Proposed Threatened due to Similarity of Appearance (T S/A). T S/A species are not subject to Section (7a) consultation and a biological conclusion is not required. However, this project is not expected to affect the bog turtle since the only palustrine emergent wetlands in the study corridor will not be impacted by any of the alternatives.

**Virginia Big-eared Bat** - The Virginia big-eared bat, formerly assigned to the genus *Plecotus*, is an endangered, isolated eastern subspecies of a more common, widespread species of bat. Virginia big-eared bat is distinguished from all other eastern bats except Rafinesque's big-eared bat (*C. rafinesquii*) by its large ears, which equal nearly half the body length. Virginia big-eared bat differs from Rafinesque's big-eared bat in having buffy or brownish rather than whitish underparts (Handley 1991), hairs with little contrast between bases and tips, and having hair on the feet that does not extend beyond the tips of the toes (Webster et al. 1985).

In North Carolina, Virginia big-eared bats roost year-round in limestone caves at elevations above 1500 feet (460 meters) (Webster et al. 1985). Mines are rarely used for roosting (LeGrand and Hall 1995). Virginia big-eared bats typically forage within 2 mi (3.2 kilometers) from the roost (Handley 1991). NHP records do not indicate that Virginia big-eared bat has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect Virginia big-eared bat due to the absence of known roosting caves within the study corridor. **NO EFFECT**

**Peregrine Falcon** - The peregrine falcon is a medium-sized falcon, reaching a length between 16 to 20 in (41 and 51 centimeters), or slightly larger than an American crow (*Corvus brachyrhynchos*). Adults have bluish-gray backs and wings, barring on the pale underparts, and a black nape and crown with a wide black wedge extending below the eye. Immature peregrine falcons are dark brown above with a heavily streaked breast, and a dark bar or wedge is present below the eye (NGS 1987). Peregrine falcons feed on medium-sized birds, including waterfowl, shorebirds, and pigeons, which they strike in midair. Peregrine falcons migrate in the fall, but over-wintering birds may be present along the North Carolina coast (Hamel 1992).

Peregrine falcons were extirpated from nesting sites in the mountains of North Carolina, but have been reintroduced to western North Carolina through a hacking program (captive-reared and released). Peregrine falcons nest on ledges on remote cliffs in areas where a mixture of forests and extensive fields, marshes, or water is present (Hamel 1992). NHP records do not indicate that peregrine falcon has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect peregrine falcons due to the absence of suitable nesting habitat (remote cliffs) within the study corridor. Since NHP records do not indicate that peregrine falcons have been recorded as nesting in the project vicinity, there are no impacts anticipated to nesting or foraging habitats. **NO EFFECT**

**Eastern Cougar** - The eastern cougar is a possibly extinct eastern subspecies of the widespread mountain lion species. This species was possibly extirpated from North Carolina by the late 1800s although recent sporadic sightings have been reported from remote areas of the mountains and coastal plain (Lee 1987). Mountain lions are large, long-tailed cats; adult males may measure 7 to 9 feet (2.1 to 2.7 meters) total length with females averaging 30 to 40 percent smaller (Handley 1991). Adult mountain lion tracks measure approximately 3.5 inches (9 centimeters) (Lee 1987).

Recent specimens of mountain lion taken in North Carolina and elsewhere in mid-Atlantic states have proved to be individuals of other subspecies that have escaped or been released from captivity (Lee 1987, Handley 1991). The eastern cougar would require large tracts of relatively undisturbed habitat that support

large populations of white-tailed deer (Webster *et al.* 1985). NHP records do not indicate that eastern cougar has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect eastern cougar due to the absence of suitably remote wilderness within the study corridor. **NO EFFECT**

**Carolina Northern Flying Squirrel** - The Carolina northern flying squirrel is an isolated, endangered subspecies of the more wide-ranging northern flying squirrel. Flying squirrels are nocturnal and have a loose, fully furred fold of skin on each side of the body between the wrists and the ankles that enable the squirrels to glide from trees to other trees or to the ground for foraging. Carolina northern flying squirrel can be distinguished from the similar southern flying squirrel (*G. volans*) by larger size (ranging from 26.0 to 10.2 to 12.0 inches (30.5 centimeters) total length) and by having gray rather than white bases of the ventral hairs (Weigl 1987).

The Carolina northern flying squirrel typically occurs in spruce-fir forests and mature hardwood forest adjacent to spruce-fir forests at elevations above 4000 feet (1200 meters) (Weigl 1987). Endemic to the Appalachians of western North Carolina and eastern Tennessee, this subspecies is known from the Great Smoky Mountains, Roan Mountain, and Mount Mitchell. NHP records do not indicate that Carolina northern flying squirrel has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect Carolina northern flying squirrel due to the absence of suitable habitat within the low elevation (approximately 2040 feet (620 meters)) study corridor. **NO EFFECT**

**Indiana Bat** - The Indiana bat is a small, brown bat measuring 3.0 to 3.6 inches (7.7 to 9.1 centimeters) total length. The Indiana bat is distinguished from other eastern bats by having a keeled calcar (cartilaginous projection from the hind foot), relatively small ears that do not extend beyond the nose when pulled forward, short toe hairs that do not extend beyond the toes, and two tiny teeth in a gap between the canines and cheek teeth (Handley 1991).

Indiana bats hibernate in winter in limestone caves usually where standing water is present (Webster *et al.* 1985). Indiana bats also use mine tunnels for hibernation (Handley 1991). In summer, males continue to roost in caves, but females roost in maternity colonies located in hollow trees and under loose bark of trees typically located near streams or small rivers (Webster *et al.* 1985). Indiana bats forage over tree-lined streams and upland woods (Handley 1991). NHP records do not indicate that Indiana bat has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect Indiana bats due to the absence of known roosting caves within the study corridor. **NO EFFECT**

**Appalachian Elktoe** - Appalachian elktoe is a small, subovate to kidney-shaped freshwater mussel that grows to approximately 3.1 inches (8.0 centimeters) length, 1.4 inches (3.5 centimeters) height, and 1.0 inches (2.5 centimeters) width (Clarke 1981). The shell is thin, but not fragile, and exhibits slight inflation along the posterior ridge near the center of the shell. Beaks project only slightly above the hinge line. Lateral teeth are absent; however, the hinge plate of both valves is thickened. Small, pyramidal, compressed pseudocardinal teeth are present, and an interdental projection is present in the left valve. Juveniles are yellowish brown, but the periostracum (outer shell surface) is thicker and dark brown in adults. Individuals may be variably marked with prominent to obscure greenish rays. The nacre (shell interior) is shiny, blue to bluish white with salmon, pinkish, or brownish coloring in the central portion of the shell and beak cavity.

Appalachian elktoe is endemic to the upper Tennessee River system in the mountains of western North Carolina and eastern Tennessee. Appalachian elktoe habitat has been described as riffle areas with gravel and cobble substrate (TSCFTM 1990). In North Carolina, this species may now be restricted to the Little Tennessee and Nolichucky drainages (LeGrand and Hall 1995). Recent WRC surveys have documented this species in the Little Tennessee River in Macon and Swain Counties, Cane River in Yancey County, and Nolichucky and North Toe Rivers in Yancey and Mitchell Counties. NHP records indicate that Appalachian elktoe has been documented within the North Toe River within or adjacent to the study corridor.

**BIOLOGICAL CONCLUSION:** Because habitat for Appalachian elktoe exists within the study corridor, and the species has been documented recently within or adjacent to the study corridor, detailed surveys will be necessary to determine whether individuals are present within the impact area. Informal consultation should be initiated with the U.S. Fish and Wildlife Service (FWS) regarding measures to be taken to avoid adverse effects to Appalachian elktoe. Impacts to this species will be minimized by implementing the NCDOT's *Best Management Practices for Surface Waters* and North Carolina regulations entitled *Design Standards in Sensitive Watersheds*, as practicable, during construction. **UNRESOLVED**

A Consultation in compliance with **Section (7a)** of the Endangered Species Act of 1973 will follow this CE document in order to more closely identify the specific course of action necessary to minimize impacts to the endangered Appalachian Elktoe Mussel species.

**Spreading Avens** - Spreading avens is an erect, densely hairy, perennial herb to 50 centimeters (20 inches ) tall. A basal rosette of odd-pinnately compound leaves is produced from a horizontal rhizome. These leaves are long stalked and terminated by a large kidney-shaped lobe; tiny leaflets are usually present below the terminal lobe (Kral 1983). Small, sessile, serrated leaves are found on the flowering stem. Lanceolate sepals and relatively long petal lengths of 1.3 to 2.0 centimeters (0.5 to 0.8 inches ) help differentiate spreading avens from related species (Massey *et al.* 1983). Bright yellow, five-petaled flowers approximately 2.4 to 3.1 inches (6 to 8 centimeters) across are produced from June to August; these are followed between July and October by hairy achenes with a persistent, straight style approximately 0.2 inches (1 centimeters) long (Massey *et al.* 1983). Vegetative parts may emerge in May and persist through October.

Spreading avens usually occurs at elevations greater than 5000 feet (1524 meters) in mountain grass balds or in grassy clearings, in heath balds as well as in crevices of granitic rock; it cannot tolerate shading

or crowding (Kral 1983). Spreading avens is found in a few northwestern counties of North Carolina, and in nearby counties of Tennessee. NHP records do not indicate that spreading avens has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect spreading avens due to the absence of suitable habitat within the low elevation (approximately 620 meters (2040 ft)) study corridor. **NO EFFECT**

**Roan Mountain Bluet** - Roan Mountain bluet, formerly treated as a variety of the summer bluet (*Houstonia* [= *Hedyotis*] *purpurea*), is a low, erect to spreading perennial herb with a squarish stem typically growing to 6 inches (15 centimeters) high. The leaves are opposite, sessile, rounded basally but taper to a pointed tip and have smooth, toothless margins. Small, deep purple, tubular flowers are produced on small terminal clusters in June and July with fruiting occurring in July and August. It differs from the more common *H. purpurea* by having larger, smooth-edged leaves, and by larger flowers, capsules, and seeds (Weakley 1993).

Roan Mountain bluet is endemic to the high Blue Ridge mountains of North Carolina and Tennessee, mostly from 4200 to 6300 feet (1280 to 1920 meters) in elevation. It grows in crevices of rock outcrops as well as in thin, gravelly soils of grassy balds near summit outcrops (Weakley 1993). NHP records do not indicate that Roan Mountain bluet has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect Roan Mountain bluet due to the absence of suitable habitat within the low elevation (approximately 2040 feet (620 meters)) study corridor. **NO EFFECT**

**Heller's Blazing Star** - Heller's blazing star is an erect herbaceous perennial with glabrous stems that reaches heights of 10 to 4 to 20 inches (50 centimeters). The leaves are simple, linear to lanceolate, alternate, and arranged spirally along the stem. Leaf size is variable, with a gradual decrease in size up the stem. The inflorescence consists of compact heads arranged in a raceme-like fashion along the stem. The heads typically contain seven to ten tubular florets which may be purple to lavender in color. Heller's blazing star is distinguished from related species by shorter height and relatively short pappus (modified calyx lobes) half or less the length of the corolla tube. Flowers are produced from July to September, with fruiting occurring from August to October (Massey *et al.* 1983).

Heller's blazing star has been found on rocky summits at high elevations in the mountains of western North Carolina. This species typically is found in full sun growing in shallow, acidic soils on or around granitic outcrops, ledges, and cliff faces (Kral 1983, Massey *et al.* 1983). Heller's blazing star is reported to occur at elevations between approximately 1070 and 1900 meters. NHP records do not indicate that Heller's blazing star has been documented within 2 kilometers. (32.0 mi) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect Heller's blazing star due to the absence of suitable habitat within the low elevation (approximately 62040 feet (20 meters)) study corridor. **NO EFFECT**

**Blue Ridge Goldenrod** - Blue Ridge goldenrod is an erect, perennial herb growing to 16 inches (40 centimeters) in height with simple leaves in a basal rosette and along the stem. Leaves are serrate, ciliate, smooth to slightly scabrous above and glabrous beneath, and progressively reduced in size and more

sessile towards the inflorescence. The unpleasant aroma of this plant leads to an alternative common name, skunk goldenrod. Blue Ridge goldenrod can be distinguished from other two goldenrod species having a corymbiform inflorescence and golden rays by its shorter height, involucre bracts not being striate-nerved, and distribution at high altitudes in the mountains (Massey *et al.* 1983). Vegetative portions of the plant may emerge in July and persist through October (Massey *et al.* 1983). Flowering occurs from late July to September (Kral 1983).

Blue Ridge goldenrod is found on rocky summits above approximately 4000 feet (1200 meters) elevation in the mountains. Typically found in full sun, this plant may be found rooted in fine sands that have accumulated in cracks and pockets of granitic rocks or bluff ledges, or associated with grasses and sedges on grass balds contiguous to rock outcrops (Kral 1983). In North Carolina, the current distribution may be restricted to Avery and Mitchell Counties (Amoroso and Weakley 1995). NHP records do not indicate that Blue Ridge goldenrod has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect Blue Ridge goldenrod due to the absence of suitable habitat within the low elevation (approximately 2040 feet (620 meters)) study corridor. **NO EFFECT**

**Virginia Spiraea** - Virginia spiraea is a deciduous, colonial shrub that averages 1 to 3 meters (3 to 10 ft) in height, but may reach heights of 13 feet (4 meters). Its short-stalked leaves are alternate, nearly toothless, and narrowly elliptic with a pointed tip (Radford *et al.* 1968). Numerous small, white, 5-petaled flowers are produced on terminal clusters in June to July. Dried corymbs often persist through winter. Seed production is reported to be sporadic and most colonies are believed to arise from downstream dispersal and establishment of fragments of horizontal rootstock (Porter and Wieboldt 1991).

Endemic to the southern Appalachians, Virginia spiraea is restricted to disturbance-prone riverine areas, specifically along scoured banks of high gradient streams, meander scrolls, point bars, natural levees, and braided features of lower stream reaches (Porter and Wieboldt 1991). Disturbance is required for removal of woody competitors and to aid in establishment of colonies. NHP files indicate that Virginia spiraea has been documented on the Cane River more than 5.0 mi (8.0 kilometers) upstream from the confluence with the North Toe River. NHP records do not indicate that Virginia spiraea has been documented in the North Toe River within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** The subject project was visited by NCDOT biologists May 8, 2003. The potential impact zones were visually examined for the presence of this species by walking along proposed construction area. No spiraea plants were found within the project study area surveyed. It can be concluded that project construction will have no impact on the Virginia spiraea. **NO EFFECT**

**Rock Gnome Lichen** - The rock gnome lichen is a small, squamulose (strap-like) lichen in the reindeer moss (lichen) family. This species is similar to squamulose lichens in the genus *Cladonia* by having terminal portions of its strap-like lobes that are blue-gray on the upper surface and shiny-white on the lower surface; rock gnome lichen differs from these other lichens by having blackened lobe bases. The lichen grows nearly parallel to the rock surface to which it is attached, but the tips curl up to a near vertical orientation. Reproduction appears to be asexual, with colonies spreading clonally. Rock gnome lichen is



typically found growing in association with a distinctively colored, reddish-brown moss (*Andreaea*) (Murdock 1993).

The rock gnome lichen is endemic to the mountains of North Carolina and Tennessee. Most populations occur above approximately 5000 feet (1525 meters) in elevation in areas subject to frequent fog cover, but the species has been found at lower elevations in deep gorges where a similarly high humidity regime is present. Rock gnome lichen typically occurs on vertical rock faces subject to intermittent seepage (Murdock 1993). NHP records do not indicate that rock gnome lichen has been documented within 2.0 mi (3.2 kilometers) of the project bridge.

**BIOLOGICAL CONCLUSION:** This project is not expected to affect rock gnome lichen due to the absence of suitable habitat within the low elevation (approximately 2040 feet (620 meters)) study corridor. **NO EFFECT**

**Spuce- Fir Moss Spider** - The spruce-fir moss spider is currently known from only four locations. There are three sites in North Carolina (one in Avery/Caldwell Counties and two in Swain County) and one in Tennessee (Sevier County). At this time, only the population in Avery/Caldwell Counties in North Carolina appears to be stable. The other two populations in North Carolina are very small, with only one individual found at each in recent searches (Harp 1992). The Tennessee population has been considered healthy in the past, but is currently declining due to habitat loss.

This spider is typically found in damp moss and liverwort mats growing on rocks in well shaded, mature, high elevation Fraser fir and red spruce forests (Harp 1992). This spider cannot tolerate desiccation. The spider constructs its web under the moss, at the interface with the rock. Webs are tube-shaped, thin-walled, and generally flat with short side branches. Little is known about the diet of the spruce-fir moss spider, but springtails (Order Collembola) are abundant in the moss mats and probably constitute most of the prey (Harp 1992).

**BIOLOGICAL CONCLUSION:** This project is not expected to affect the spruce-fir moss spider due to the absence of suitable habitat within the low elevation (approximately 2040 feet (620 meters)) study corridor. **NO EFFECT**

**Federal species of concern** - The February 24, 2003 FWS list also includes a category of species designated as "Federal species of concern" (FSC). The FSC designation provides no federal protection under the ESA for the species listed. The presence of potential suitable habitat within the study corridor has been evaluated for the following FSC species listed for Mitchell (M) and Yancey (Y) Counties:

<u>Common Name</u>	<u>Scientific Name</u>	<u>County</u>
Olive-sided flycatcher	<i>Contopus borealis</i>	M, Y
Hellbender	<i>Cryptobranchus alleganiensis</i>	Y
Southern rock vole	<i>Microtus chrotorrhinus</i>	Y
Eastern small-footed myotis	<i>Myotis leibii</i>	Y
Allegheny woodrat	<i>Neotoma magister</i>	M
Olive darter	<i>Percina squamata</i>	M, Y
Appalachian cottontail	<i>Sylvilagus obscurus</i>	M, Y
Fragile glyph	<i>Glyphylinia clingmani</i>	Y

Roan supercoil	<i>Paravitrea varidens</i>	M, Y
Yancey sideswimmer	<i>Stygobromus carolinensis</i>	Y
Diana fritillary butterfly	<i>Speyeria diana</i>	M
Fraser fir	<i>Abies fraseri</i>	M, Y
Roan false goat's beard	<i>Astilbe crenatiloba</i>	M
Piratebush	<i>Buckleya distichophylla</i>	M
Cain's reedgrass	<i>Calamagrostis cainii</i>	Y
Mountain bittercress	<i>Cardamine clematitis</i>	Y
Roan sedge	<i>Carex roanensis</i>	M No
Tall larkspur	<i>Delphinium exaltatum</i>	M
Glade spurge	<i>Euphorbia purpurea</i>	M, Y
Bent geum	<i>Geum geniculatum</i>	M
Butternut	<i>Juglans cinerea</i>	M, Y
Gray's lily	<i>Lilium grayi</i>	M, Y
Canby's mountain lover (cliff green)	<i>Paxistima canbyi</i>	M
Carolina saxifrage	<i>Saxifraga caroliniana</i>	Y
Mountain catchfly	<i>Silene ovata</i>	Y
A liverwort	<i>Bazzania nudicaulis</i>	M, Y
Mount LeConte moss	<i>Leptohyemenium sharpii</i>	Y
A liverwort	<i>Plagiochila caduciloba</i>	Y
A liverwort	<i>Plagiochila sharpii</i>	Y
A liverwort	<i>Plagiochila sullivantii</i>	
	var. <i>sullivantii</i>	M, Y
A liverwort	<i>Sphenolobopsis pearsonii</i>	M, Y
Blotched chub	<i>Erimystax insignis</i>	M, Y
Sharphead darter	<i>Etheostoma acuticeps</i>	M, Y
Southern Appalachian black- capped chickadee	<i>Peoocile atricapillus praticus</i>	M
Southern Appalachian red crossbill	<i>Loxia curvirostra</i>	M
Southern Appalachian saw- whet owl	<i>Aegeolus acadicus</i>	M
Southern Appalachian yellow- billed sapsucker	<i>Spyrapicus varius appalaciensis</i>	M
Bent avens	<i>Geum geniculatum</i>	M

NHP files do not document any FSC within the study corridor, nor in the North Toe or Nolichucky River within 3.2 kilometers upstream or downstream from the study corridor. Two FSC species, olive darter and hellbender, have been documented within the lower 2.0 mi (3.2 kilometers) reach of the Cane River.

#### State Protected Species

Plant and animal species which are on the North Carolina state list as Endangered (E), Threatened (T), or Special Concern (SC) receive limited protection under the North Carolina Endangered Species Act (G.S. 113-331 *et seq.*) and the North Carolina Plant Protection Act of 1979 (G.S. 106-202 *et seq.*).

NHP records indicate that the state-Special Concern wavy-rayed lampshell (*Lampsilis fasciola*) has been documented in the North Toe River within or adjacent to the study corridor. Two state-listed fish species, sharphead darter (*Etheostoma acuticeps*) and logperch (*Percina caprodes*), have been documented in the North Toe River between 0.8 and 1.0 and 2.3 mi (3.7 kilometers) upstream from the study corridor. Suitable habitat for these species may be present in the study corridor. Sharphead darter and two other state-listed fish species, the state-Endangered stonecat (*Noturus flavus*) and state-Threatened striped shiner (*Luxilus chrysocephalus*), which have been documented in the lower 3.6 miles (5.8 km) reach of Cane Creek and which is located a short distance downstream from study corridor, may be expected to occur within the study corridor as well. No terrestrial state-listed species have been documented within 2.0 mi (3.2 kilometers) of the study corridor. Impacts to these species can be alleviated by bridging of the main river channel.

#### National Forest Lands

Portions of the study corridor north of the North Toe River and west of SR 1340 are located on private holdings within established boundaries of the Pisgah National Forest. No National Forest Lands will be affected.

### **IX. CULTURAL RESOURCES**

This project is subject to compliance with Section 106 of the Natural Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106, codified at 36 CFR Part 800. Section 106 requires that if a federally funded, licensed, or permitted project has an effect on a property listed in or eligible for the National Register of Historic Places, the Advisory Council on Historic Preservation be given an opportunity to comment. Pursuant to Section 106, comments were requested from the Deputy State Historic Preservation Officer (SHPO) and were received on March 3, 1997 (see Appendix).

Based on comments received from the SHPO, it is unlikely that any archaeological resources which may be eligible for inclusion in the National Register of Historic Places will be affected by this project. Therefore, no archaeological investigations will be conducted for this project.

There are no structures of historic or architectural importance located within the area of potential effect of this project.

### **X. ENVIRONMENTAL EFFECTS**

Replacement of Bridge No. 143 will not have an adverse effect on the quality of the human or natural environment if current NCDOT standards and specifications are implemented. A section seven consultation will be required concerning the Appalachian Elktoe mussel species following completion of this document. The project should have an overall positive impact due to the improvement of existing poor bridge conditions and substandard roadway geometrics (one-lane bridge). The new bridge and approaches will result in safer traffic operations in the project area.

This project is not in conflict with any plan, existing land use, or zoning regulation. No Significant change in land use is expected to result from replacement of Bridge No. 143.

No adverse impact on families or communities is anticipated with the implementation of the preferred alternative (Alternate B). No relocatees are expected with implementation of Alternate B.

This project will not have an adverse effect on any prime, important or unique farmlands, therefore it is exempt from the Farmland Protection Policy Act.

No publicly owned parks, recreational facilities, or wildlife and waterfowl refuges of national, state or local significance in the immediate vicinity of the project will be impacted.

No geodetic survey markers will be impacted by this project.

No adverse effects to air quality are expected as a result of this project. This project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis (if applicable) and a project level CO analysis is not required. If vegetation or wood debris is disposed of by open burning, it shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520. This evaluation completes the assessment requirements for air quality, no additional reports are required.

Ambient noise levels may increase during the construction of this project, however this increase will be only temporary and usually confined to daylight hours. There should be no notable change in traffic volumes after this project is complete. Therefore, this project will have no adverse effect on existing noise levels. Noise receptors in the project area will not be impacted by this project. This evaluation completes the assessment requirements for highway noise set forth in 23 CFR Part 772. No additional reports are required.

The preferred alternative will not adversely affect the existing floodplain and flow characteristics of the North Toe River.

This project is being processed as a Federal Categorical Exclusion due to its limited scope and lack of significant environmental consequences. Based on the assessment of the existing human and natural environment, it is concluded that no significant adverse environmental effect will result from the replacement of Bridge No. 143.

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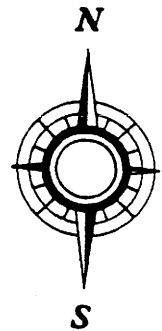
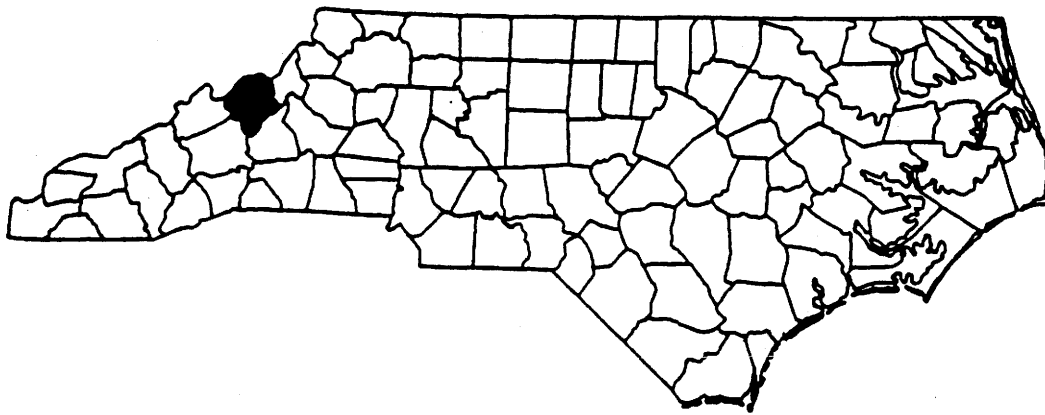
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# FIGURES



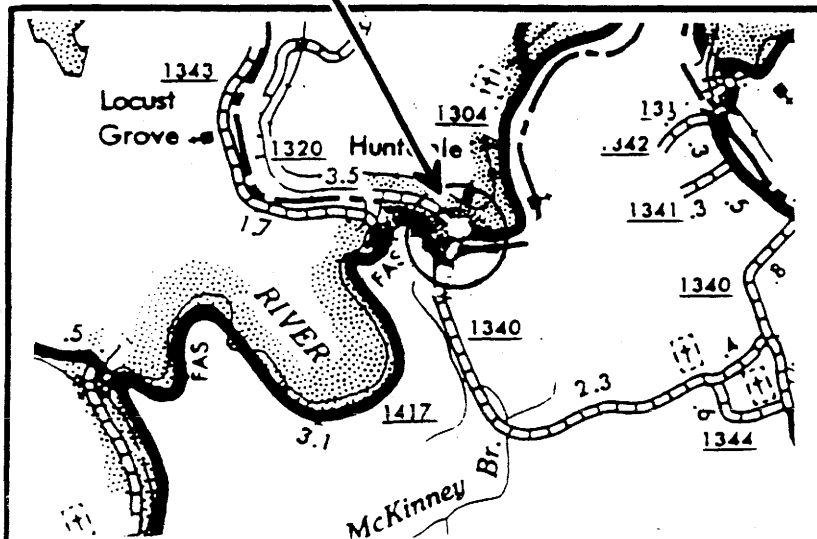
# MITCHELL / YANCEY COUNTY

NORTH CAROLINA

Bridge No. 143

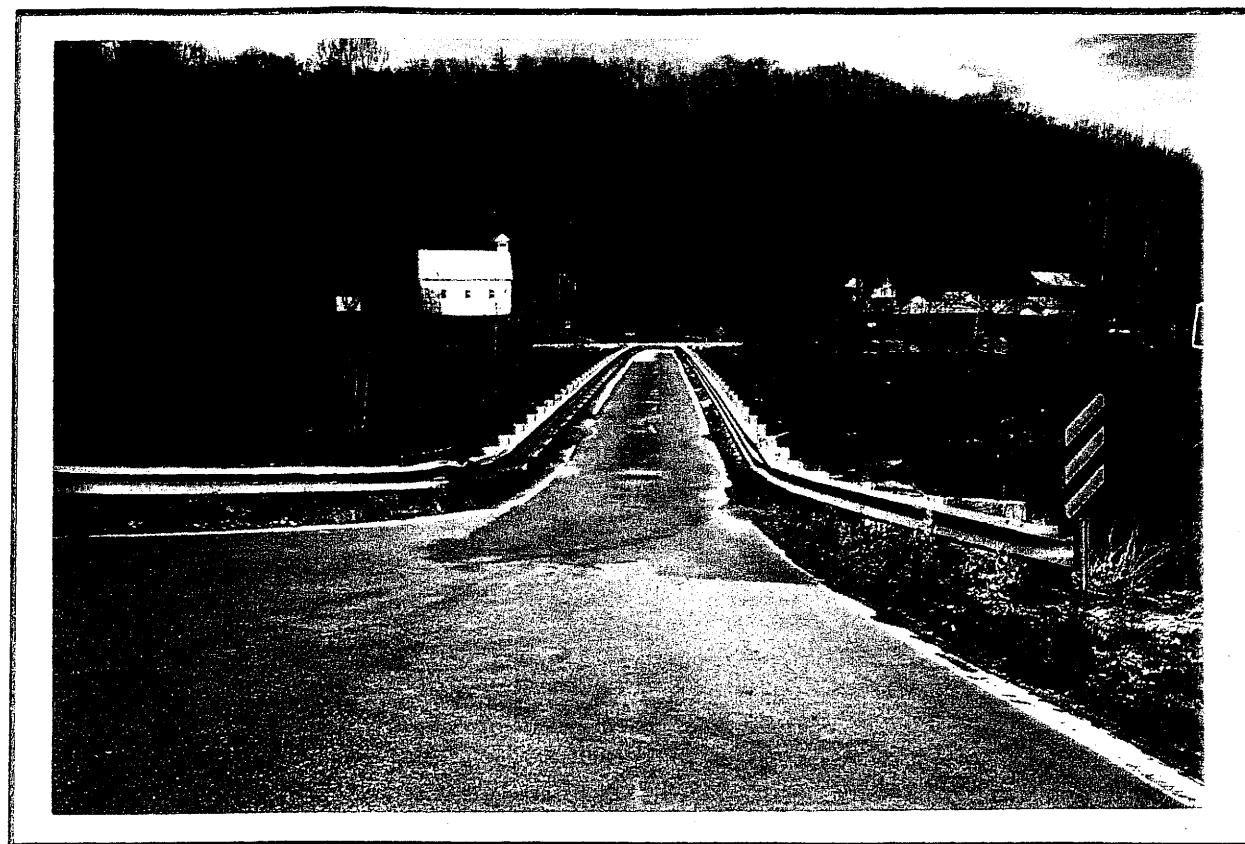


SCALE: Not-to-Scale



	<p>North Carolina Department of Transportation Division of Highways Planning and Environmental Branch</p>
<p>TIP PROJECT NO. B-2848 REPLACE BRIDGE NO. 143 ON SR 1304 OVER NORTH TOE RIVER MITCHELL/YANCEY COUNTIES, NORTH CAROLINA</p>	
<p>SITE LOCATION MAP</p>	<p>FIGURE 1</p>

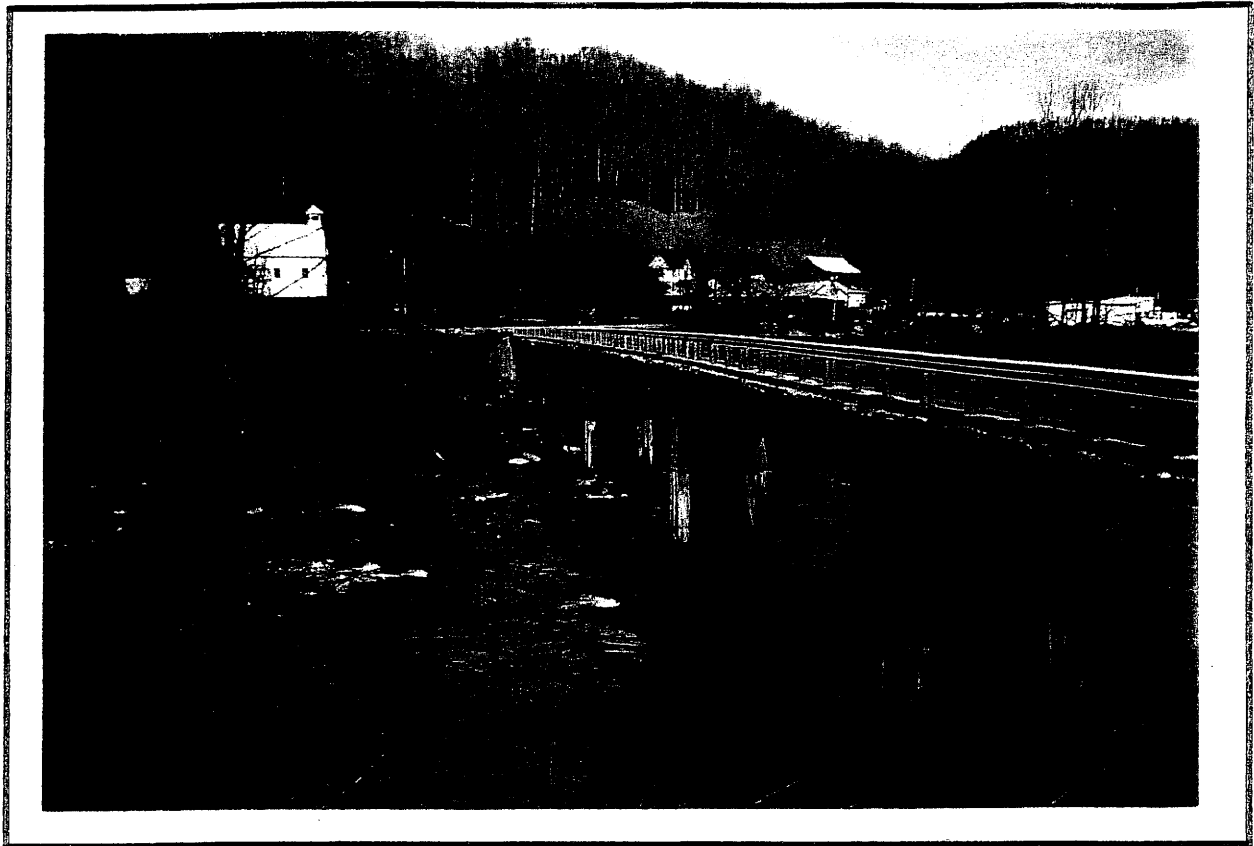




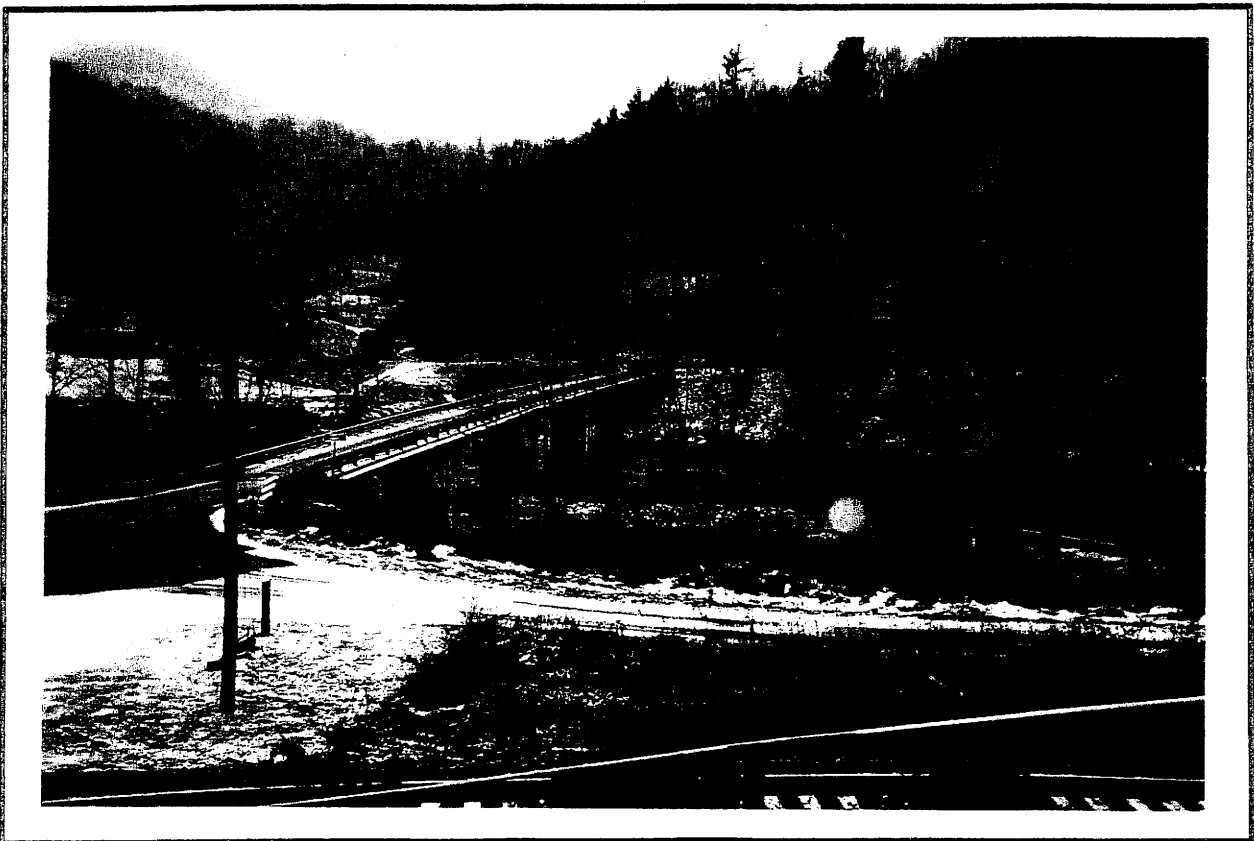
LOOKING NORTH AT BRIDGE #143



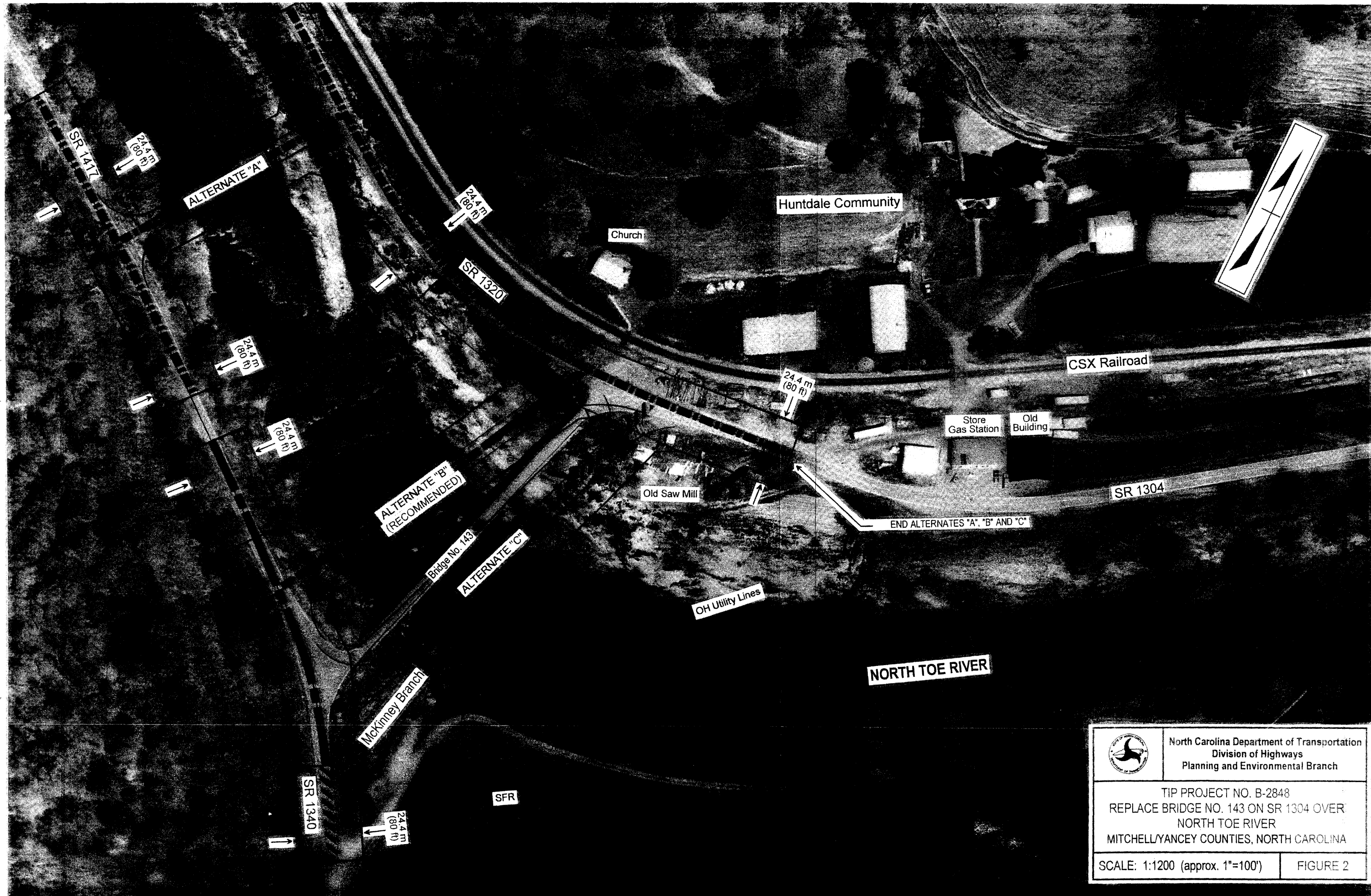
LOOKING SOUTH AT BRIDGE #143




LOOKING NORTH AT BRIDGE #143



LOOKING SOUTH AT BRIDGE #143



	North Carolina Department of Transportation Division of Highways Planning and Environmental Branch	
	TIP PROJECT NO. B-2848 REPLACE BRIDGE NO. 143 ON SR 1304 OVER NORTH TOE RIVER MITCHELLYANCEY COUNTIES, NORTH CAROLINA	
	SCALE: 1:1200 (approx. 1"=100')	FIGURE 2



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1499



April 23, 1997

Mr. H. Franklin Vick, P.E.  
Manager  
Planning and Environmental Branch  
North Carolina Division of Highways  
Post Office Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

BRIDGE REPLACEMENT GROUP XII (WESTERN NORTH CAROLINA), NCDOT TIP NUMBERS B-2150, B-2848, B-2927, B-3000, B-3118, B-3189, AND B-3205, FRENCH BROAD RIVER TRIBUTARIES AND NORTH TOE RIVER, BUNCOMBE, HAYWOOD, MADISON, MCDOWELL, MITCHELL, AND YANCEY COUNTIES, NORTH CAROLINA

As a follow-up to my letter of March 5, 1997, on the proposed bridge replacement projects in western North Carolina, I wish to transmit the following additional information obtained through a search of TVA's heritage database. No information was available for bridges not listed. Information is listed by bridge and represents species that may be in appropriate habitats in the vicinity of the bridge listed.

- B-2150, NC 212, Bridge #32 over Shelton Laurel Creek, Madison County

Aquatic Animals

freshwater drum	<i>Aplodinotus grunniens</i>	State Threatened (ST)
river carpsucker	<i>Carpiodes carpio</i>	State Special Concern (SPCO)
banded sculpin	<i>Cottus carolinae</i>	ST
mooneye	<i>Hiodon tergisus</i>	SPCO
American brook lamprey	<i>Lampetra appendix</i>	ST
mountain madtom	<i>Noturus eleutherus</i>	SPCO
logperch	<i>Percina caprodes</i>	ST
longhead darter	<i>Percina macrocephala</i>	SPCO
dusky darter	<i>Percina sciera</i>	State Endangered (SE)
olive darter	<i>Percina squamata</i>	SPCO
paddlefish	<i>Polyodon spatula</i>	SE

Plants

clinton lily	<i>Clintonia borealis</i>	SPCO
mapleleaf alumroot	<i>Heuchera longiflora</i>	SPCO
	var. <i>aceroides</i>	
Virginia waterleaf	<i>Hydrophyllum virginianum</i>	ST

Mr. H. Franklin Vick, P.E.

Page 2

April 23, 1997

- B-2848, SR 1304, Bridge #143 over North Toe River, Mitchell and Yancey Counties

Aquatic Animals

Appalachian elktoe  
(FE)

sharphead darter  
wavy-rayed lampmussel  
striped shiner  
stonecat  
tangerine darter

*Alasmodonta raveneliana*

*Etheostoma acuticeps*  
*Lampsilis fasciola*  
*Luxilus chrysocephalus*  
*Noturus flavus*  
*Percina aurantiaca*

Federal Endangered

ST  
SPCO  
ST  
SE  
State in Need of  
Management (NMG)  
SE  
ST  
SPCO

blotchside logperch  
logperch  
olive darter

*Percina burtoni*  
*Percina caprodes*  
*Percina squamata*

Plants

Virginia spiraea

*Spiraea virginiana*

Federal Threatened  
(FT)

Terrestrial Animals

common hellbender

*Cryptobranchus a. alleganiensis* SPCO

- B-2927, US 19-23-74, Bridge #123 over Southern Railway, Buncombe County

Aquatic Animals

blotchside logperch  
logperch  
longhead darter  
paddlefish

*Percina burtoni*  
*Percina caprodes*  
*Percina macrocephala*  
*Polyodon spathula*

SE  
ST  
SPCO  
SE

Plants

ginseng

*Panax quinquefolius* ST

Terrestrial Animals

black vulture

*Coragyps atratus* SPCO

- B-3000, SR 1407, Bridge #304 over Mill Creek and Southern Railroad, McDowell County

Aquatic Animals

Appalachian disc

French Broad crayfish  
Carolina seep scud

*Anguispira mordax*

*Cambarus reburus*  
*Stygobromus carolinensis* ST

State-Listed, Status Undetermined,  
Uncertain, or Poorly Known (STUN)  
Watch List (WATC)

Terrestrial Animals

Diana

*Speyeria diana*

SPCO

Mr. H. Franklin Vick, P.E.

Page 3

April 23, 1997

- B-3118, SR 1674, Bridge #165 over Beaver Dam Creek, Buncombe County

Aquatic Animals

blotchside logperch	<i>Percina burtoni</i>	SE
logperch	<i>Percina caprodes</i>	ST
paddlefish	<i>Polyodon spathula</i>	SE

Wetlands In the Construction Location:

PSS1A (palustrine/scrub-shrub/broad-leaved deciduous/ temporarily flooded)

- B-3189, SR 1643, Bridge #272 over Southern Railroad, Haywood County  
No Sensitive resources or wetlands records for the vicinity of this project.

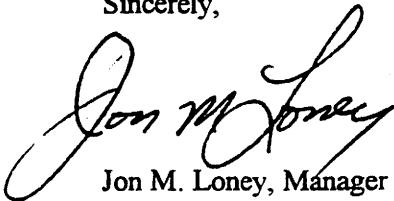
- B-3205, NC 209, Bridge #30 over Spring Creek, Madison County

Aquatic Animals

freshwater drum	<i>Aplodinotus grunniens</i>	ST
banded sculpin	<i>Cottus carolinae</i>	ST
barrens topminnow	<i>Fundulus julisia</i>	ST
mooneye	<i>Hiodon tergisus</i>	SPCO
mountain madtom	<i>Noturus eleutherus</i>	SPCO
logperch	<i>Percina caprodes</i>	ST
dusky darter	<i>Percina sciera</i>	SE
olive darter	<i>Percina squamata</i>	SPCO

Should you have any questions, please contact Harold M. Draper at (423) 632-6889 or [hmdraper@tva.gov](mailto:hmdraper@tva.gov).

Sincerely,



Jon M. Loney, Manager  
Environmental Management

**U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT, COMMENTS ON:**

**"Notification of Start of Study and Request for Project Input, Bridge Replacement Group XII (Western North Carolina)"**

**2. WATERS AND WETLANDS: (Continued)**

d. The report should address impacts to recreational navigation (if any) if a bridge span will be replaced with a box culvert.

e. The report should address potential impacts to anadromous fish passage if a bridge span will be replaced with culverts.

At this point in time, construction plans are not available for review. When final plans are complete, including the extent and location of any work within waters of the United States and wetlands, our Regulatory Branch would appreciate the opportunity to review those plans for a project-specific determination of DA permit requirements.

**For additional information, please contact the following individuals:**

David Baker at (704) 271-4856 for Buncombe, Haywood, Madison, Mitchell, and Yancey Counties

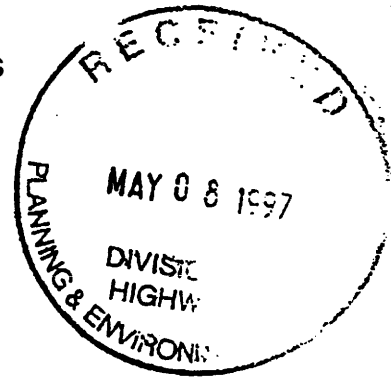
Steve Chapin at (704) 271-4014 for Burke and McDowell Counties



DEPARTMENT OF THE ARMY  
WILMINGTON DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 1890  
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

May 2, 1997



Special Studies and  
Flood Plain Services Section

Mr. H. Franklin Vick, P.E., Manager  
Planning and Environmental Branch  
North Carolina Division of Highways  
Post Office Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

This is in response to your letter of February 10, 1997, subject, "Notification of Start of Study and Request for Project Input, Bridge Replacement Group XII (Western North Carolina)." The bridge replacement projects are located in various Western North Carolina counties.

Our comments are enclosed. We appreciate the opportunity to comment on these projects. If we can be of further assistance, please contact us.

Sincerely,

*W. Coleman*

C. E. Shuford, Jr., P.E.  
Acting Chief, Engineering  
and Planning Division

Enclosure

Copies Furnished (with enclosure  
and incoming correspondence):

Mr. Roger Milstead  
River System Operations  
Tennessee Valley Authority  
400 West Summit Hill Drive  
Knoxville, Tennessee 37902-1499

Mr. Jamie James (CEORN-EP-H-M)  
U.S. Army Engineer District, Nashville  
Post Office Box 1070  
Nashville, Tennessee 37202-1070



May 2, 1997

Page 1 of 4

**U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT, COMMENTS ON:**

**"Notification of Start of Study and Request for Project Input, Bridge Replacement Group XII (Western North Carolina)"**

**1. FLOOD PLAINS: POC - Bobby L. Willis, Special Studies and Flood Plain Services Section, at (910) 251-4728**

All of the bridges, except for those in Burke and McDowell Counties, are within the planning jurisdiction of the U.S. Army Corps of Engineers (USACE), Nashville District. These bridges are located within counties which participate in the National Flood Insurance Program (NFIP). From the various Flood Insurance Rate Maps (FIRMs), it appears that both approximate study and detail study streams are involved. (Detail study streams are those with 100-year flood elevations determined and [generally] a floodway defined). A summary of flood plain information pertaining to these bridges is contained in the following table. The FIRMs are from the county flood insurance study unless otherwise noted.

<u>Bridge No.</u>	<u>Route No.</u>	<u>County</u>	<u>Study Stream</u>	<u>Type</u>	<u>Date Of Firm</u>
32	NC 212	Madison	Shelton Laurel Ck.	Approx	9/82
143	SR 1304	Mitchell/Yancey	North Toe River	Approx	9/88
123	US 19-23	Buncombe	None (So. RR)	None	5/96
304	SR 1407	McDowell	Mill Ck./So. RR	Approx	2/97
164	SR 1674	Buncombe	Beaver Dam Ck.	Detail	5/96
52	US 70 Bus.	Burke	Hunting Ck.	Detail	2/87 *
272	SR 1643	Haywood	None (So. RR)	None	1/82 **
30	NC 209	Madison	Spring Ck.	Detail***	9/82
81/92	US 221	McDowell	Catawba River	Detail ****	7/88

\* Map is City of Morganton FIRM.

\*\* Map is Town of Canton FIRM.

\*\*\* Detailed study limit is downstream side of road.

\*\*\*\* No floodway computed.

**U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT, COMMENTS ON:**

**"Notification of Start of Study and Request for Project Input, Bridge Replacement Group XII (Western North Carolina)"**

**1. FLOOD PLAINS: (Continued)**

Reference is made the Federal Emergency Management Agency's (FEMA's) "Procedures for 'No Rise' Certification for Proposed Developments in Regulatory Floodways", copies of which have been provided previously to your office. The project should be designed to meet the requirements of the NFIP, administered by FEMA, and be in compliance with all local ordinances. The engineering point of contact for the NFIP in this FEMA region is Ms. Bel Marquez, who may be reached at (770) 220-5436. Specific questions pertaining to community flood plain regulations or developments should be referred to the local building official.

All of the affected counties, except for Burke and McDowell Counties, are within the planning jurisdiction of the USACE, Nashville District, and the Tennessee Valley Authority (TVA) with respect to any construction or development involving the flood plains. The Nashville District does not currently have projects that would be affected by the proposed project. Mr. Jamie James may be contacted at (615) 736-5948 for further information and comments from the Nashville District. Flood plain concerns are normally addressed within the TVA Section 26a permitting process. A 26a permit is required for all construction or development involving streams or flood plains in the Tennessee River drainage basin. Mr. Roger Milstead at (423) 632-6115 should be contacted for information on the TVA 26a permitting process.

**2. WATERS AND WETLANDS: POC - Asheville Field Office, Regulatory Branch (Individual POC's are listed following the comments.)**

All work restricted to existing high ground will not require prior Federal permit authorization. However, Department of the Army permit authorization pursuant to Section 404 of the Clean Water Act of 1977, as amended, will be required for the discharge of excavated or fill material in waters of the United States or any adjacent and/or isolated wetlands in conjunction with your proposed bridge replacements, including disposal of construction debris.

**U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT, COMMENTS ON:**

"Notification of Start of Study and Request for Project Input, Bridge Replacement Group XII (Western North Carolina)"

**2. WATERS AND WETLANDS: (Continued)**

The replacement of these bridges may be eligible for nationwide permit authorization [33 CFR 330.5(a)(23)] as a Categorical Exclusion, depending upon the amount of jurisdictional wetlands to be impacted by a project and the construction techniques utilized. Please be reminded that, prior to utilization of nationwide permits within any of the 25 designated mountain trout counties, the North Carolina Department of Transportation should provide a letter of notification to the Asheville Regulatory Field Office and the appropriate North Carolina Wildlife Resources Commission office with reference to impacts to mountain trout water habitat. The mountain trout designation carries discretionary authority for the utilization of nationwide permits. In addition, any jurisdictional impacts associated with temporary access roads or detours, cofferdams, or other dewatering structures should be addressed in the Categorical Exclusion documentation in order to be authorized by Nationwide Permit No. 23 (NWP 23). If such information is not contained within the Categorical Exclusion documentation, then other DA permits may be required prior to construction activities.

Where possible, the bridges should be replaced with bridges, and impacts to the channel and wetlands should be avoided and/or minimized. Although these projects may qualify for NWP 23 as a categorical exclusion, the project planning report should contain sufficient information to document that the proposed activity does not have more than a minimal individual or cumulative impact on the aquatic environment. Accordingly, we offer the following comments and recommendations to be addressed in the planning report:

- a. The report should contain the amount of permanent and temporary impacts to waters and wetlands as well as a description of the type of habitat that will be affected.
- b. Off-site detours are always preferable to on-site (temporary) detours in wetlands. If an on-site detour is the recommended action, justification should be provided.
- c. Project commitments should include the removal of all temporary fills from waters and wetlands. In addition, if undercutting is necessary for temporary detours, the undercut material should be stockpiled to be used to restore the site.

**U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT, COMMENTS ON:**

**"Notification of Start of Study and Request for Project Input, Bridge Replacement Group XII (Western North Carolina)"**

**2. WATERS AND WETLANDS: (Continued)**

d. The report should address impacts to recreational navigation (if any) if a bridge span will be replaced with a box culvert.

e. The report should address potential impacts to anadromous fish passage if a bridge span will be replaced with culverts.

At this point in time, construction plans are not available for review. When final plans are complete, including the extent and location of any work within waters of the United States and wetlands, our Regulatory Branch would appreciate the opportunity to review those plans for a project-specific determination of DA permit requirements.

**For additional information, please contact the following individuals:**

David Baker at (704) 271-4856 for Buncombe, Haywood, Madison, Mitchell, and Yancey Counties

Steve Chapin at (704) 271-4014 for Burke and McDowell Counties

Federal Aid # PRZ-1304(4) TIP # B-2548 County MITCHELL/YANCEY

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR  
THE NATIONAL REGISTER OF HISTORIC PLACES

Brief Project Description REPLACE BRIDGE NO. 143 ON SR 1304 OVER NORTH TCE  
RIVER (BRIDGE GROUP XII)  
xii

On APRIL 17, 1997, representatives of the

- ☒ North Carolina Department of Transportation (NCDOT)  
☐ Federal Highway Administration (FHWA)  
☒ North Carolina State Historic Preservation Office (SHPO)  
☐ Other \_\_\_\_\_

reviewed the subject project at

- ☐ A scoping meeting  
☒ Historic architectural resources photograph review session/consultation  
☐ Other \_\_\_\_\_

All parties present agreed

- ☐ there are no properties over fifty years old within the project's area of potential effects.  
☒ there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effects.  
☒ there are properties over fifty years old (list attached) within the project's area of potential effects, but based on the historical information available and the photographs of each property, properties identified as Bridge #143, old saw mill, and House #1 are considered not eligible for National Register and no further evaluation of them is necessary.  
☒ there are no National Register-listed properties within the project's area of potential effects.

Signed:

Clay Gifford  
Representative, NCDOT

4/17/97  
Date

W. S. Raskin  
FHWA, for the Division Administrator, or other Federal Agency

4/20/97  
Date

Debra K. Bevin  
Representative, SHPO

4/17/97  
Date

W. D. Wood  
State Historic Preservation Officer

5/1/97  
Date

## WATER MANAGEMENT STANDARD CONDITIONS

For all **off-reservoir** requests, a condition should be placed in any general permit or letter of no jurisdiction to inform the applicant of the need to comply with local floodplain regulations that may be in effect. The condition should read:

You should contact your local government official(s) to ensure that this facility complies with all applicable local floodplain regulations.

The following conditions should be used for **all** bridge and culvert approvals:

1. Best Management and Best Engineering Practices will be used to prevent the introduction of soil or any other pollutants into surface or groundwaters, including but not limited to the following:
  - a. Installing cofferdams and/or silt control structures between construction areas and the streams prior to any soil-disturbing demolition/construction activity, and clarifying all water that is trapped or accumulates behind these devices to meet water quality criteria before it is returned to the stream. Cofferdams must be used wherever construction activity is at or below water elevation.
  - b. Removing demolition products and construction by-products from the site for recycling, if practicable, or proper disposal outside of a 100-year floodplain.
  - c. Minimizing removal of vegetation.
  - d. Keeping equipment out of streams (i.e., performing work "in the dry").
  - e. Keeping equipment off stream banks to the degree practicable.
  - f. Using erosion control structures around any material stockpile areas.
  - g. Removing, redistributing, and stabilizing (with vegetation) all sediment which accumulates behind cofferdams and silt control structures.
  - h. Using vegetation (versus shot rock or riprap) wherever practicable and sustainable, to stabilize streambanks and floodplain areas. These areas will be stabilized as soon as practicable, using either an appropriate seed mixture that includes an annual (quick cover) as well as 1 or 2 perennial legumes and 1 or 2 perennial grasses, or equivalent sod. In certain periods of the year, this will require initial planting of a quick cover annual only, to be followed by subsequent establishment of the perennials. Seed and soil will be protected as appropriate with erosion control netting and/or mulch, and provided adequate moisture. Streambank and floodplain areas will also be permanently stabilized with native woody plants, to include trees wherever practicable and sustainable and consistent with other regulatory agency specifications.
  - i. Applying clean/shaken riprap or shot rock (where needed at water/bank interface) over a water permeable/soil impermeable fabric or geotextile and in such a manner as to avoid stream sedimentation or disturbance.
  - j. Avoiding spilling concrete, or other substances or materials, into the streams.
  - k. Designing/constructing any instream piers in such a manner as to discourage river scouring or sediment deposition.
  - l. Bank, shoreline, and floodplain stabilization will be permanently maintained in order to prevent erosion, protect water quality, and preserve aquatic habitat.
  - m. Culverts are constructed in phases, and adequate streambank protection measures are employed, such that the diverted streamflow is handled without creating streambank or streambed erosion/sedimentation and without preventing fish passage.

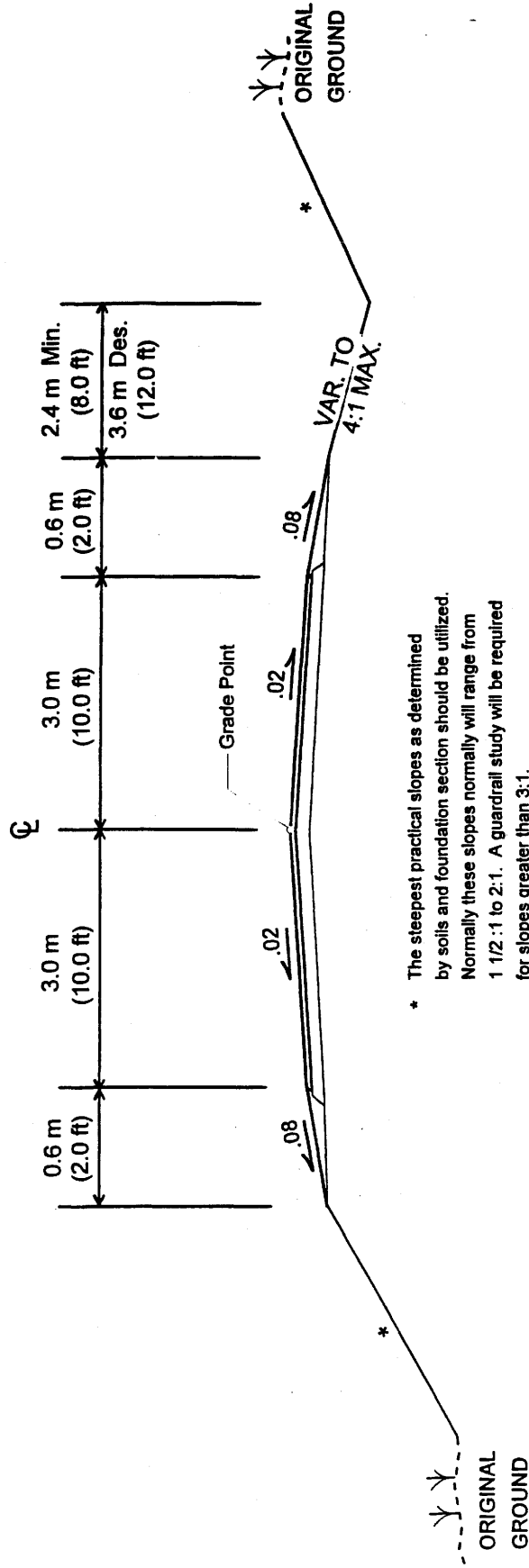
2. **Concrete box culverts and pipe culverts (and their extensions) must create/maintain velocities and flow patterns which offer refuge for fish and other aquatic life, and allow passage of indigenous fish species, under all flow conditions. Culvert floor slabs and pipe bottoms must be buried at least one foot below streambed elevation, and filled with naturally-occurring streambed materials. If geologic conditions do not allow burying the floor, it must be otherwise designed to allow passage of indigenous fish species under all flow conditions.**
3. **All natural stream values (including equivalent energy dissipation, elevations, and velocities; riparian vegetation; riffle/pool sequencing; habitat suitable for fish and other aquatic life) must be provided at all stream modification sites. This must be accomplished using a combination of rock and bioengineering, and is not accomplished using solid, homogeneous riprap from bank to bank.**

# TYPICAL ROADWAY CROSS SECTION

B-2848

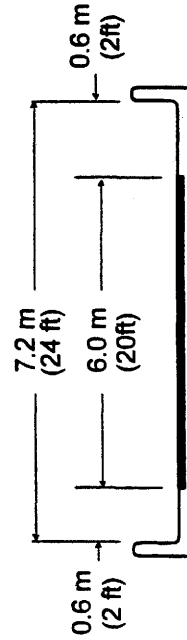
BRIDGE #143 ON SR 1304 OVER NORTH TOE RIVER

MITCHELL/YANCEY COUNTY



## DESIGN CRITERIA

DESIGN SPEED	≤ 50 km/h (30 mph)
CURRENT YEAR ADT (1997)	180 vpd
DESIGN YEAR ADT (2017)	300 vpd
% TTST, % DUALS	2%, 3%
FUNCTIONAL CLASSIFICATION	RURAL MINOR COLLECTOR
TERRAIN	MOUNTAINOUS
MINIMUM RADIUS	90 m (if possible)
MAXIMUM GRADE	10%
SUPERELEVATION RATE	$e_{max} = 0.06$



## TYPICAL BRIDGE CROSS SECTION

FIGURE 5



# **APPENDIX**



# MITCHELL COUNTY BOARD OF EDUCATION

OFFICE OF THE SUPERINTENDENT

Robert Arrowood  
Assistant Superintendent  
Dr. Bill Sears  
Assistant Superintendent  
Elena Street  
Finance Officer

115 School Road  
Bakersville, North Carolina 28705  
(704) 688-4432 or 688-3232 — FAX (704) 688-4095  
Dale Duncan, Superintendent

**BOARD MEMBERS**  
Bill M. Sparks, Chairman  
Mrs. Jackie Blevins  
Doug Dellinger  
Marvin Miller  
Ed Terrell

**DATE:** February 24, 1997

**TO:** Mr. Gerald H. Knott  
Section Chief  
School Planning  
Dept. of Public Inst.  
301 N Wilmington St.  
Raleigh, NC 27601-2825

**FROM:** Dale Duncan, Supt.  
Mitchell County Schools

**SUBJECT:** National Environmental Policy Act

I don't know of any environmental impacts that I could share concerning the replacement of SR 1304, Bridge #143 on North Toe River, NCDOT Tip No. B-2848.

Sincerely,

Dale Duncan, Supt.  
Mitchell County Schools

DD/cp

State of North Carolina  
Department of Environment,  
Health and Natural Resources  
Division of Water Quality

James B. Hunt, Jr., Governor  
Jonathan B. Howes, Secretary  
A. Preston Howard, Jr., P.E., Director



February 26, 1997

MEMORANDUM

To: Ms. Cindy Sharer, P.E., NCDOT, Planning & Environmental

From: Cyndi Bell, NC Division of Water Quality *CLB*

Subject: Water Quality Checklist for Bridge Replacement Projects

Reference your correspondence dated February 10, 1997, in which you requested preliminary comments concerning nine bridge replacement projects. The Division of Water Quality requests that NCDOT consider the following generic environmental commitments for design and construction of bridge replacements:

- A. DWQ requests that DOT strictly adhere to North Carolina regulations entitled "Design Standards in Sensitive Watersheds" (15A NCAC 04B .0024) throughout design and construction for this project in the area that drains to streams having WS (Water Supply), ORW (Outstanding Resource Water), HQW (High Quality Water), B (Body Contact), SA (Shellfish Water) or Tr (Trout Water) classifications to protect existing uses.
- B. DWQ requests that bridges be replaced on existing location with road closure, when practical. If an on-site detour is necessary, remediation measures in accordance with DWQ requirements for General 401 Certification 2726/Nationwide Permit No. 33 (Temporary Construction, Access and Dewatering) must be followed.
- C. DWQ requests that hazardous spill catch basins be installed at any bridge crossing a stream classified as HQW or WS (Water Supply). The number of catch basins installed should be determined by the design of the bridge, so that runoff would enter said basin(s) rather than directly flowing into the stream.
- D. To the maximum extent practicable, DOT should not install the bridge bents in the creek.
- E. Wetland impacts should be avoided (including sediment and erosion control structures/measures) to the maximum extent practical. If this is not possible, alternatives that minimize wetland impacts should be chosen. Mitigation for unavoidable impacts will be required by DWQ if impacts exceed one acre. Smaller impacts may require mitigation by the U.S. Army Corps of Engineers.
- F. Borrow/waste areas should not be located in wetlands. It is likely that compensatory mitigation will be required if wetlands are impacted by waste or borrow.
- G. DWQ prefers replacement of bridges with bridges. If the new structure is to be a culvert, it should be countersunk to allow unimpeded fish passage through the crossing.

- H. If foundation test borings will be required, this should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3027/Nationwide Permit No. 6 for Survey Activities. Written concurrence from the North Carolina Wildlife Resources Commission and U.S. Army Corps of Engineers is required in designated mountain trout counties.
- I. If this project is processed as a Categorical Exclusion, NCDOT is reminded that mitigation will be required if wetland impacts exceed one acre, in accordance with DWQ Wetland Rules (15A NCAC 2H.0506 (h)(2)).

The attached table has been prepared by DWQ for your assistance in studying the systems involved in these bridge replacements. This information includes the DWQ Index Number, DWQ Stream Classification, river basin, and preliminary comments for each crossing. Please note that National Wetland Inventory (NWI) map references are not to be replaced by onsite wetland determinations by qualified biologists.

Thank you for your request for DWQ input. DOT is reminded that issuance of a 401 Water Quality Certification requires satisfaction of water quality concerns, to ensure that water quality standards are met and designated uses are not lost or degraded. Questions regarding the 401 Certification or other water quality issues should be directed to Cyndi Bell at (919) 733-1786 in DWQ's Water Quality Environmental Sciences Branch.

cc: Michelle Suverkrubbe  
Melba McGee

B2150.DOC

T.I.P. No.	Bridge No.	Location	Project Description	Stream Name	County	DWQ Stream Index No.	DWQ Stream Classification	River Basin	Comments
B-2150	32	NC 212	Replace	Shelton Laurel Creek	Madison	I = 6-112-26	C Tr	French Broad	NWI maps show no wetlands in project area.
B-2848	143	SR 1304	Replace	North Toe River	Mitchell and Yancey	I = 7-2-71	C Tr	French Broad	NWI maps show no wetlands within project area.
B-2927	123	US 19/23/74	Replace	Southern Railroad	Buncombe	N/A	N/A	N/A	N/A
B-3000	304	SR 1407	Replace	Mill Creek and Southern Railroad	McDowell	I = 11-7	C Tr	Catawba	NWI maps show no wetlands within project area.
B-3118	164	SR 1674	Replace	Beaver Dam Creek	Buncombe	I = 6-82	C	French Broad	NWI map show no wetlands in project area.
B-3121	52	US 70 Business	Replace	Hunting Creek	Burke	I = 11-36-(0.7)	WS-IV	Catawba	NWI maps show wetland pockets in project area.
B-3189	272	SR 1643	Replace	Southern Railroad	Haywood	N/A	N/A	N/A	N/A

B-3205	30	NC 209	Replace	Spring Creek	Madison	I = 6-118-10	C Tr	French Broad	NWI maps show no wetlands within project area.
B-3206	81, 92, 75	US 221 Business/ NC 226	Replace	Catawba River and Overflows	McDowell	I = 11-(8)	C	Catawba	NWI maps show no wetlands within project area.



## North Carolina Department of Cultural Resources

James B. Hunt Jr., Governor  
Betty Ray McCain, Secretary

March 3, 1997

Division of Archives and History  
Jeffrey J. Crow, Director

### MEMORANDUM

TO: H. Franklin Vick, P.E., Manager  
Planning and Environmental Branch  
Division of Highways  
Department of Transportation

FROM: David Brook *David Brook/w*  
Deputy State Historic Preservation Officer

SUBJECT: Bridge Group XII, Bridge #143 on SR 1304  
over North Toe River, Mitchell and Yancey  
Counties, B-2848, ER 97-8505

Thank you for your letter of February 10, 1997, concerning the above project.

We have conducted a search of our maps and files and have located the following structures of historical or architectural importance within the general area of the project:

Robert Griffith House. North side of SR 1304, 0.1 mile east of junction with SR 1320, Hunt Dale Community. This property was placed on the state study list on January 8, 1987.

We look forward to meeting with an architectural historian from the North Carolina Department of Transportation to review the aerial and photographs of the project area so we can make our survey recommendation.

There are no known archaeological sites within the proposed project area. Based on our present knowledge of the area, it is unlikely that any archaeological resources which may be eligible for inclusion in the National Register of Historic Places will be affected by the project construction. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB:slw

cc: N. Graf  
B. Church  
T. Padgett

*Handwritten initials*

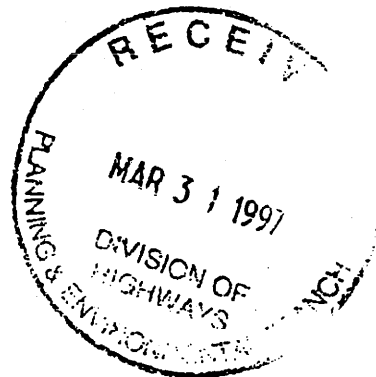


# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Asheville Field Office  
160 Zillicoa Street  
Asheville, North Carolina 28801

March 26, 1997



Mr. H. Franklin Vick, P.E., Manager  
Planning and Environmental Branch  
North Carolina Department of Transportation  
P.O. Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

Subject: Notification of start of study and request for project input, Bridge Replacement Group  
XII (Western North Carolina), TIP Numbers B-2150, B-2848, B-2927, B-3000,  
B-3118, B-3121, B-3189, B-3205, B-3206.

This is the response of the U. S. Fish and Wildlife Service (Service) to your letter of February 10, 1997, requesting input for the subject bridge replacement projects. The following comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

The Service is particularly concerned about the potential impacts the proposed projects could have on federally listed species and on Federal species of concern and the potential impacts to stream and wetland ecosystems within the area.

The Service concurs with the decision to prepare categorical exclusion documents for bridge replacement projects B-2150, B-2927, B-3000, B-3118, B-3121, B-3189, B-3205, B-3206, provided the following measures are implemented to minimize impacts to aquatic resources: (1) riparian vegetation should be maintained wherever possible, especially large trees; (2) if any riparian areas are disturbed, they should be revegetated with native species as soon as possible after construction in order to minimize runoff and lessen the impacts associated with "bare banks" (decrease in nutrient input, temperature changes, flow changes, sediment filtration, etc.); (3) stringent erosion control measures should be implemented during all construction activities in order to minimize downstream effects; and (4) construction should be accomplished so that wet concrete does not contact water entering or flowing in the stream. These measures will reduce the likelihood of aquatic impacts associated with the bridge construction.



The Service does not agree that bridge replacement project B-2848 should be categorically excluded from further environmental study due to the fact that the endangered Appalachian elktoe (*Alasmidonta raveneliana*) is known to occur in the North Toe River in the immediate vicinity of the proposed project. The North Carolina Department of Transportation should work closely with the Service to incorporate sufficient measures and monitoring, in addition to those already mentioned, to avoid impacts to this endangered mussel. Otherwise, if it is determined that the proposed project may affect the Appalachian elktoe, formal consultation, as directed by the Act, would have to be initiated with our office.

We have reviewed our files and believe the environmental document should evaluate possible impacts to the following federally listed species and/or Federal species of concern:

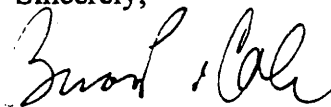
- Virginia spirea (*Spirea virginiana*) (Threatened) - This plant species is found along streams on sandbars and stream banks.
- Olive darter (*Percina squamata*) (Federal species of concern) - This small fish is found in deep swift rapids and runs near boulders.
- Hellbender (*Cryptobranchus alleganiensis*) (Federal species of concern) - This amphibian inhabits clear-flowing water areas with large flat rocks.

The presence or absence of the above-mentioned species in the project impact area should be addressed in any environmental document prepared for this project. Please note that the legal responsibilities of a Federal agency or their designated non-Federal representative with regard to federally listed endangered and threatened species under Section 7 of the Act are on file with the Federal Highway Administration. Also, please note that Federal species of concern are not legally protected under the Act and are not subject to any of its provisions, including Section 7, unless they are formally proposed or listed as endangered or threatened. We are including these species in our response in order to give you advance notification and to request your assistance in protecting them.

Additionally, the Service believes the environmental document(s) for the proposed projects should address the following issues: (1) any proposed temporary bridges or structures associated with the bridge replacements; (2) any special measures proposed to minimize sedimentation during construction; and (3) any measures that will be implemented to minimize impacts to fish and wildlife habitat (e.g., protecting riparian vegetation whenever possible).

We appreciate the opportunity to provide these scoping comments and request that you keep us informed as to the progress of these projects. In any future correspondence concerning this matter, please reference our Log Number 4-2-97-077.

Sincerely,



Brian P. Cole  
State Supervisor



Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, Tennessee 37902-1499



March 5, 1997

Mr. H. Franklin Vick, P.E.  
Manager  
Planning and Environmental Branch  
North Carolina Division of Highways  
Post Office Box 25201  
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

**BRIDGE REPLACEMENT GROUP XII (WESTERN NORTH CAROLINA), NCDOT TIP NUMBERS B-2150, B-2848, B-3118, AND B-3205, FRENCH BROAD RIVER TRIBUTARIES AND NORTH TOE RIVER, BUNCOMBE, MADISON, MITCHELL, AND YANCEY COUNTIES, NORTH CAROLINA**

TVA has reviewed the scoping notice for the proposed bridge replacement projects in western North Carolina. Approvals under Section 26a of the TVA Act would be required for the following bridges:

- B-2150, NC 212, Bridge #32 over Shelton Laurel Creek, Madison County
- B-2848, SR 1304, Bridge #143 over North Toe River, Mitchell and Yancey Counties
- B-3118, SR 1674, Bridge #165 over Beaver Dam Creek, Buncombe County
- B-3205, NC 209, Bridge #30 over Spring Creek, Madison County

Attached are typical conditions that TVA attaches to Section 26a approvals for bridges.

The other bridges do not cross tributaries of the Tennessee River and would not require Section 26a approval:

- B-2927, US 19-23-74 Bridge #123 over Southern Railroad, Buncombe County
- B-3000, SR 1407 Bridge #304 over Mill Creek, McDowell County
- B-3121, US 70 Business Bridge #52 over Hunting Creek, Burke County
- B-3189, SR 1643 Bridge #272 over Southern Railroad, Haywood County
- B-3206, US 221 Business/NC 226 Bridges #81, #92, and #75 over Catawba River and overflows.

## WATER MANAGEMENT STANDARD CONDITIONS

For all *off-reservoir* requests, a condition should be placed in any general permit or letter of no jurisdiction to inform the applicant of the need to comply with local floodplain regulations that may be in effect. The condition should read:

You should contact your local government official(s) to ensure that this facility complies with all applicable local floodplain regulations.

The following conditions should be used for *all* bridge and culvert approvals:

1. Best Management and Best Engineering Practices will be used to prevent the introduction of soil or any other pollutants into surface or groundwaters, including but not limited to the following:
  - a. Installing cofferdams and/or silt control structures between construction areas and the streams prior to any soil-disturbing demolition/construction activity, and clarifying all water that is trapped or accumulates behind these devices to meet water quality criteria before it is returned to the stream. Cofferdams must be used wherever construction activity is at or below water elevation.
  - b. Removing demolition products and construction by-products from the site for recycling, if practicable, or proper disposal outside of a 100-year floodplain.
  - c. Minimizing removal of vegetation.
  - d. Keeping equipment out of streams (i.e., performing work "in the dry").
  - e. Keeping equipment off stream banks to the degree practicable.
  - f. Using erosion control structures around any material stockpile areas.
  - g. Removing, redistributing, and stabilizing (with vegetation) all sediment which accumulates behind cofferdams and silt control structures.
  - h. Using vegetation (versus shot rock or riprap) wherever practicable and sustainable, to stabilize streambanks and floodplain areas. These areas will be stabilized as soon as practicable, using either an appropriate seed mixture that includes an annual (quick cover) as well as 1 or 2 perennial legumes and 1 or 2 perennial grasses, or equivalent sod. In certain periods of the year, this will require initial planting of a quick cover annual only, to be followed by subsequent establishment of the perennials. Seed and soil will be protected as appropriate with erosion control netting and/or mulch, and provided adequate moisture. Streambank and floodplain areas will also be permanently stabilized with native woody plants, to include trees wherever practicable and sustainable and consistent with other regulatory agency specifications.
  - i. Applying clean/shaken riprap or shot rock (where needed at water/bank interface) over a water permeable/soil impermeable fabric or geotextile and in such a manner as to avoid stream sedimentation or disturbance.
  - j. Avoiding spilling concrete, or other substances or materials, into the streams.
  - k. Designing/constructing any instream piers in such a manner as to discourage river scouring or sediment deposition.
  - l. Bank, shoreline, and floodplain stabilization will be permanently maintained in order to prevent erosion, protect water quality, and preserve aquatic habitat.
  - m. Culverts are constructed in phases, and adequate streambank protection measures are employed, such that the diverted streamflow is handled without creating streambank or streambed erosion/sedimentation and without preventing fish passage.

2. Concrete box culverts and pipe culverts (and their extensions) must create/maintain velocities and flow patterns which offer refuge for fish and other aquatic life, and allow passage of indigenous fish species, under all flow conditions. Culvert floor slabs and pipe bottoms must be buried at least one foot below streambed elevation, and filled with naturally-occurring streambed materials. If geologic conditions do not allow burying the floor, it must be otherwise designed to allow passage of indigenous fish species under all flow conditions.
3. All natural stream values (including equivalent energy dissipation, elevations, and velocities; riparian vegetation; riffle/pool sequencing; habitat suitable for fish and other aquatic life) must be provided at all stream modification sites. This must be accomplished using a combination of rock and bioengineering, and is not accomplished using solid, homogeneous riprap from bank to bank.

Mr. H. Franklin Vick, P.E.

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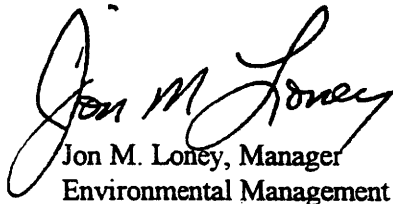
March 5, 1997

Following completion of the environmental review, please send a copy of the Categorical Exclusion documentation, along with a Section 26a application, to the following addresses:

- For TIP Project Number B-2848 (North Toe River), please send the application to TVA Upper Holston Reservoir Land Management Office, 4105 Fort Henry Drive, Suite 218, Kingsport, Tennessee 37663; telephone (423) 239-2001.
- For TIP Project Numbers B-2150, B-3118, and B-3205, please send the application to TVA Cherokee-Douglas Land Management Office, 2611 West Andrew Johnson Highway, Morristown, Tennessee 37814-3295; telephone (423) 632-3791.

Should you have any questions, please contact Harold M. Draper at (423) 632-6889 or [hmdraper@tva.gov](mailto:hmdraper@tva.gov).

Sincerely,



Jon M. Loney, Manager  
Environmental Management

Enclosure